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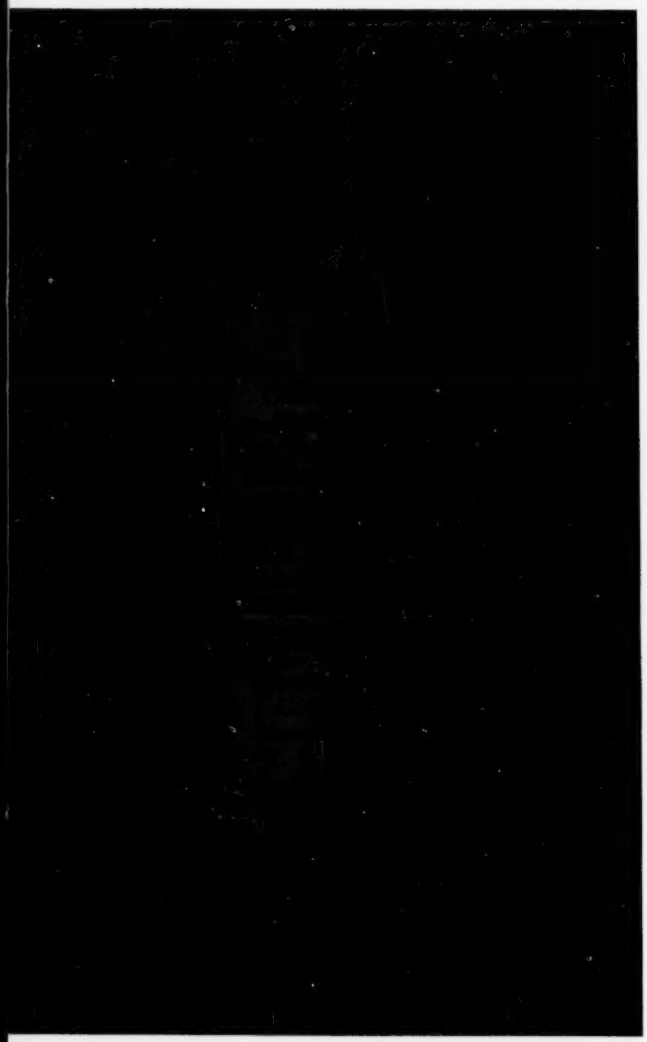
Chemical Week



What's ahead for 8 industries that consume chemicals. Here's what experts say . p. 21

Florida's fluoride pollution problem spurs new law—and concerted research .... p. 31

Complete sulfuric rundown. State-by-state list of 216 producing plants ..... p. 41

Novel acrylonitrile process puts ethylene back in running as basic raw material .. p. 53

Russia's reshuffled research setup speeds decisions. But politics bulk large ..... p. 81

September 27, 1958

Part One of Two Parts

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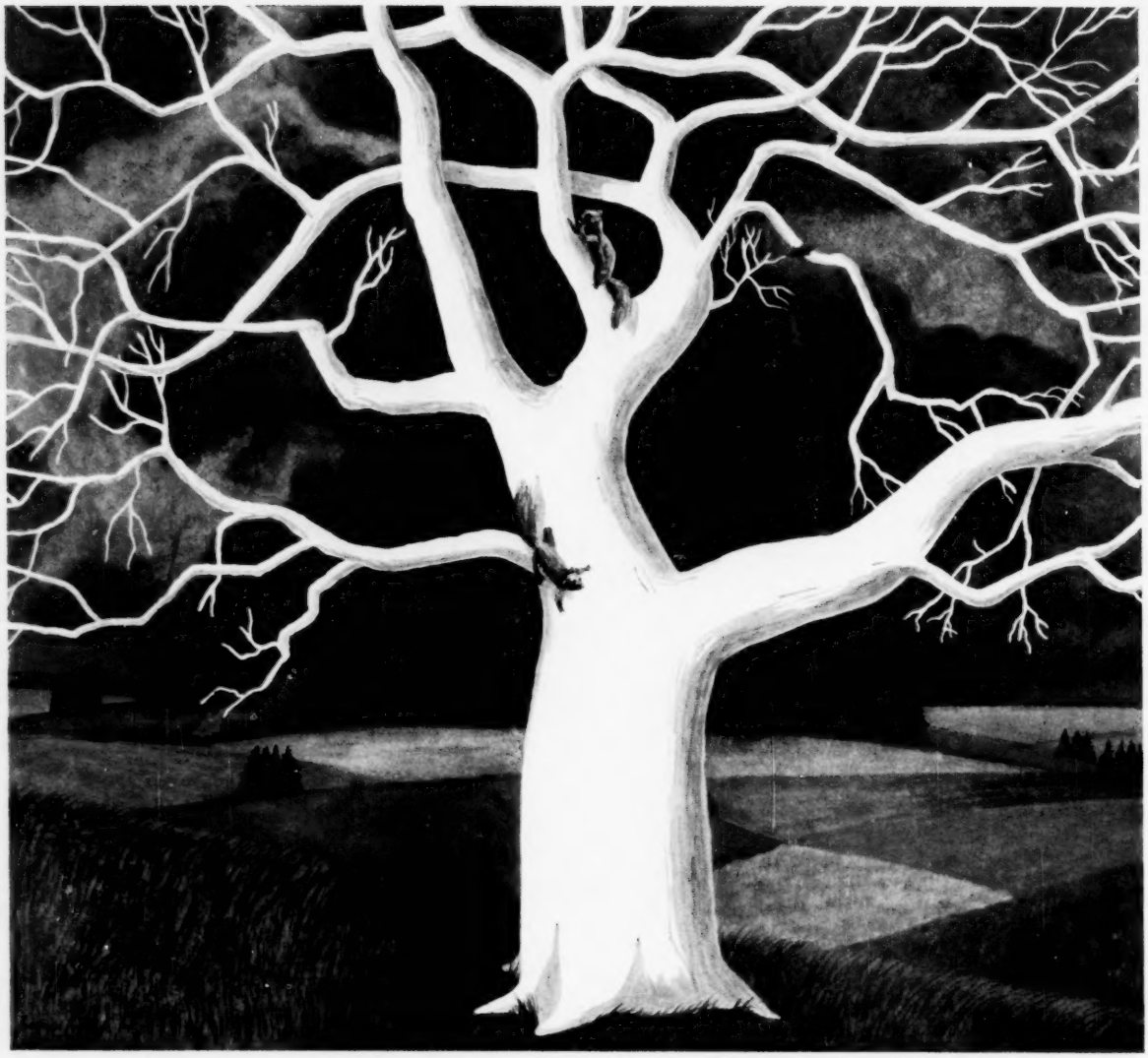

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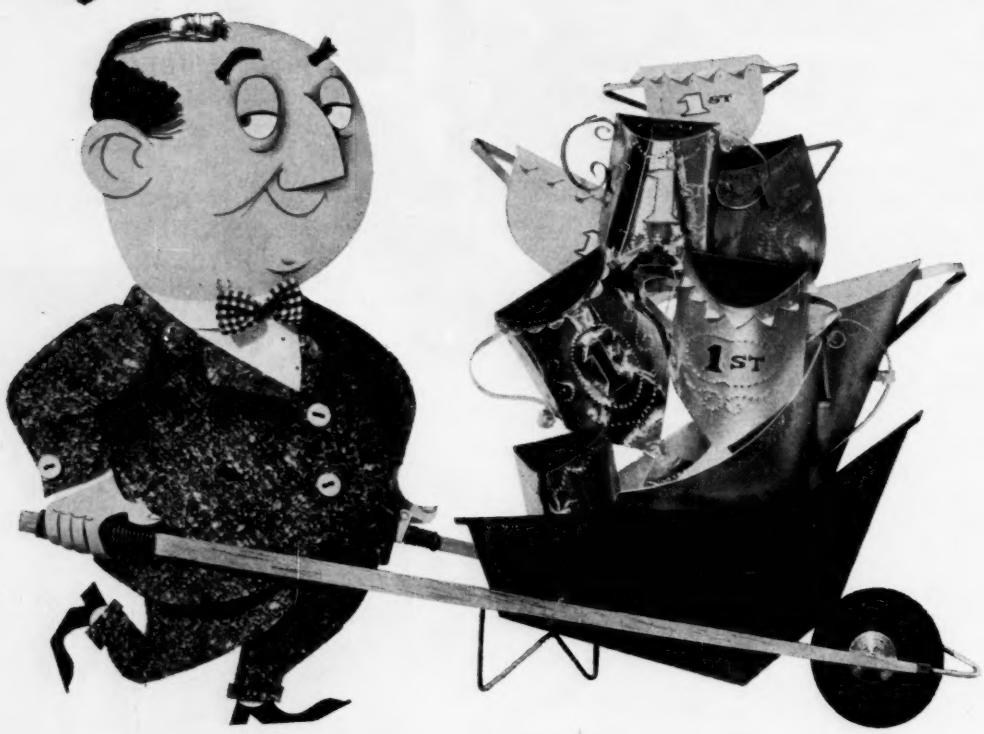

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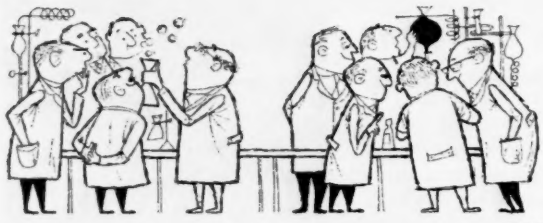

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Chemical Week

TOP OF THE WEEK **SEPTEMBER 27, 1958**

- **Monsanto charged with phosphorus "technology monopoly"** by Western fertilizer producer ..... **p. 22**
- **Pesticide makers get boost from meatpacking company** that pays farmers $1/head premium for using cattle grub insecticide ..... **p. 24**
- **Instrument technician shortage?** Industry conference prescribes special training programs ..... **p. 65**
- **Southwest's largest paint, varnish, lacquer plant** opened in Texas this week by Sherwin-Williams ..... **p. 75**

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14 OPINION

14 MEETINGS

17 BUSINESS NEWSLETTER

21 Eight big chemical consumers forecast good business for '59 at National Industrial Conference Board meeting.

22 In legal counterattack, Western fertilizer concern charges Monsanto with attempt to monopolize phosphate technology.

23 Chemical executives from three nations gather in Montreal for meeting of Society of the Chemical Industry.

24 Farmer acceptance of cattle grub insecticide spurred by meatpacker's offer to pay premium for treated steers.

24 Acetic acid expansion—Celanese's latest growth move—brings spurt in stock trading.

24 Lithium producers foresee continuing rise in sales; Lithium Corp. now listed on American Exchange.

24 Foster D. Snell, Inc., is negotiating for another acquisition.

27 WASHINGTON NEWSLETTER

31 ADMINISTRATION
Florida phosphate makers try to counter public ill will, damage suits and legislative pressures with new $350,000, three-year multi-company air pollution study.

41 MARKETS
Here's complete, state-by-state rundown of sulfuric acid plants. Estimated output for '58: 16.7 million tons. Capacity: 21 million tons.

53 ENGINEERING
Germans seek to sell novel acrylonitrile-from-acetaldehyde process in U.S. Sales points: low raw-materials cost, high yield, product purity.

61 TECHNOLOGY NEWSLETTER

65 PRODUCTION
Instrument-automation conference stresses training aids to help solve instrument technician shortage.

71 MARKET NEWSLETTER

75 SPECIALTIES
Sherwin-Williams spends $4 million on Southwest's largest paint plant. Capacity: 7 million gal./-year.

76 Survey yields sales hints on how to sell rug cleaners.

81 RESEARCH
Russia's new administrative setup quickens pace of research. Here are improvements, faults.

88 CHARTING BUSINESS
New high in output—355,000 lbs.—reflects public's renewed faith in antihistamines.

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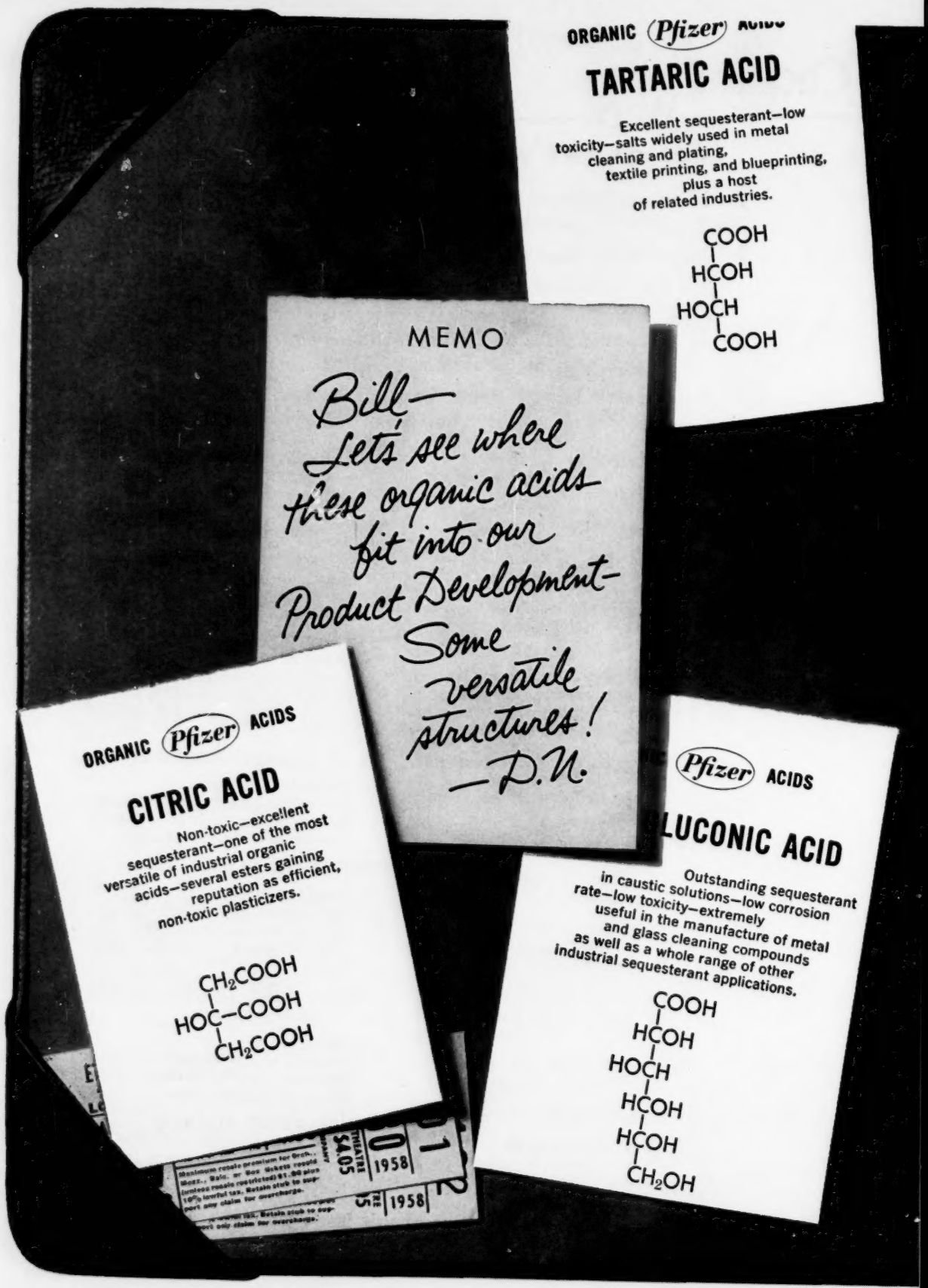
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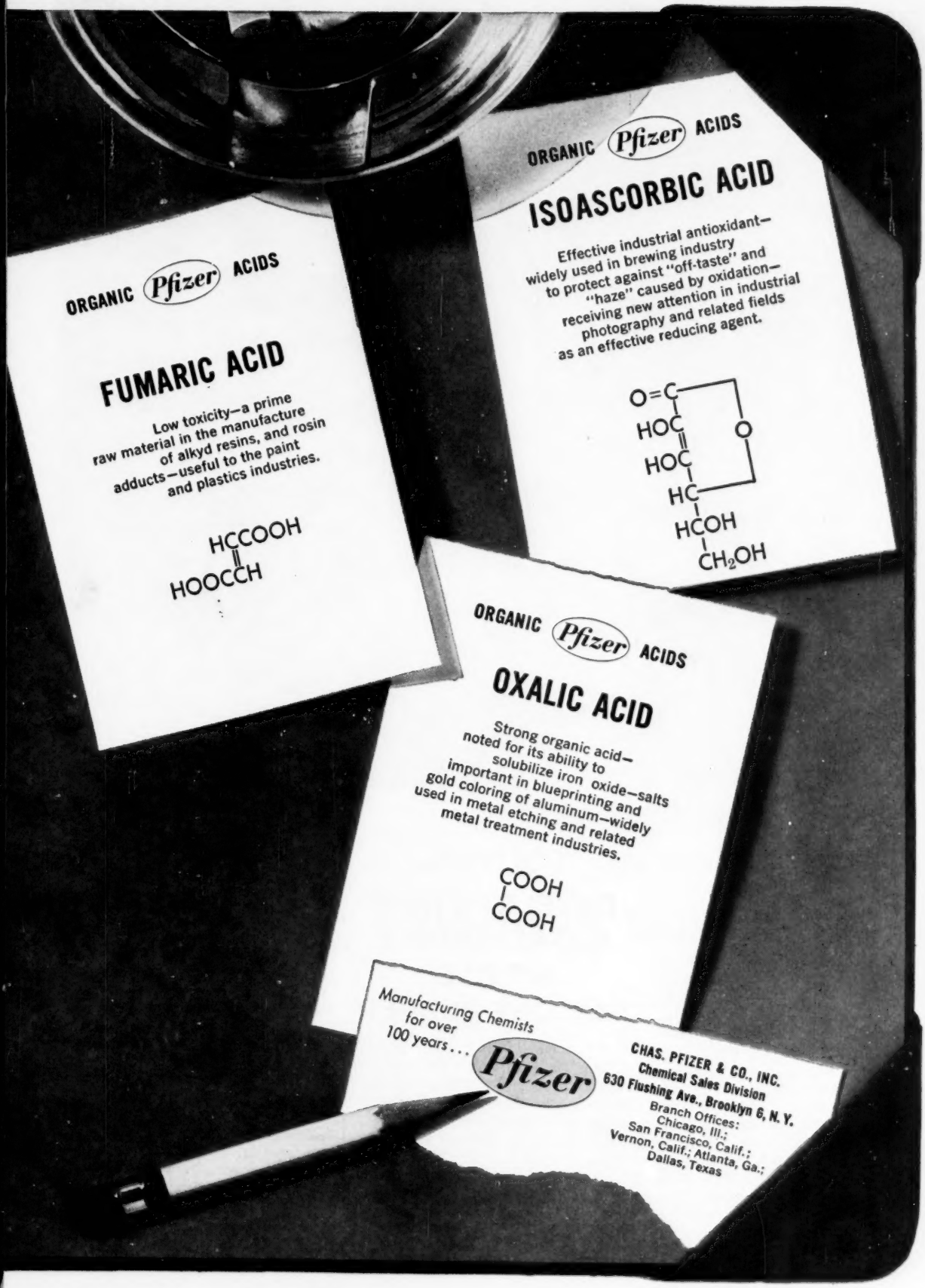
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G.E. makes Major Breakthrough in Silicone Chemistry

DEVELOPS NEW OIL-RESISTANT NITRILE SILICONE RUBBER

General Electric chemical research has announced the development of nitrile silicone rubber—a completely new kind of silicone elastomer offering exceptional resistance to oils, fuels and solvents at both low and extremely high temperatures.

New G-E Nitrile Silicone Rubber retains its physical properties at operating temperatures down to −100°F. and above 500°F. It shows excellent resistance to an extremely wide range of test fluids (among them: JP-4 jet fuel, MIL-L-7808 diester fluid, Type A transmission fluid). Chief applications seen for G-E Nitrile Silicone Rubber are as 0 rings, seals, gaskets, hose and hose couplings, fuel cells and sealing compounds. The new material will be available in commercial quantities about the end of the year and is expected to cost less than the heavily fluorinated oil-resistant elastomers now available to the aircraft and automotive industries.

G.E.'s breakthrough on nitrile silicone rubber opens up a promising new area of silicone chemistry. Look for further announcements from General Electric—where chemical research works to find new materials for American industry.

For further information, write Dept. SPD, CHEMICAL AND METALLURGICAL DIVISION, General Electric Company, Waterford, New York.

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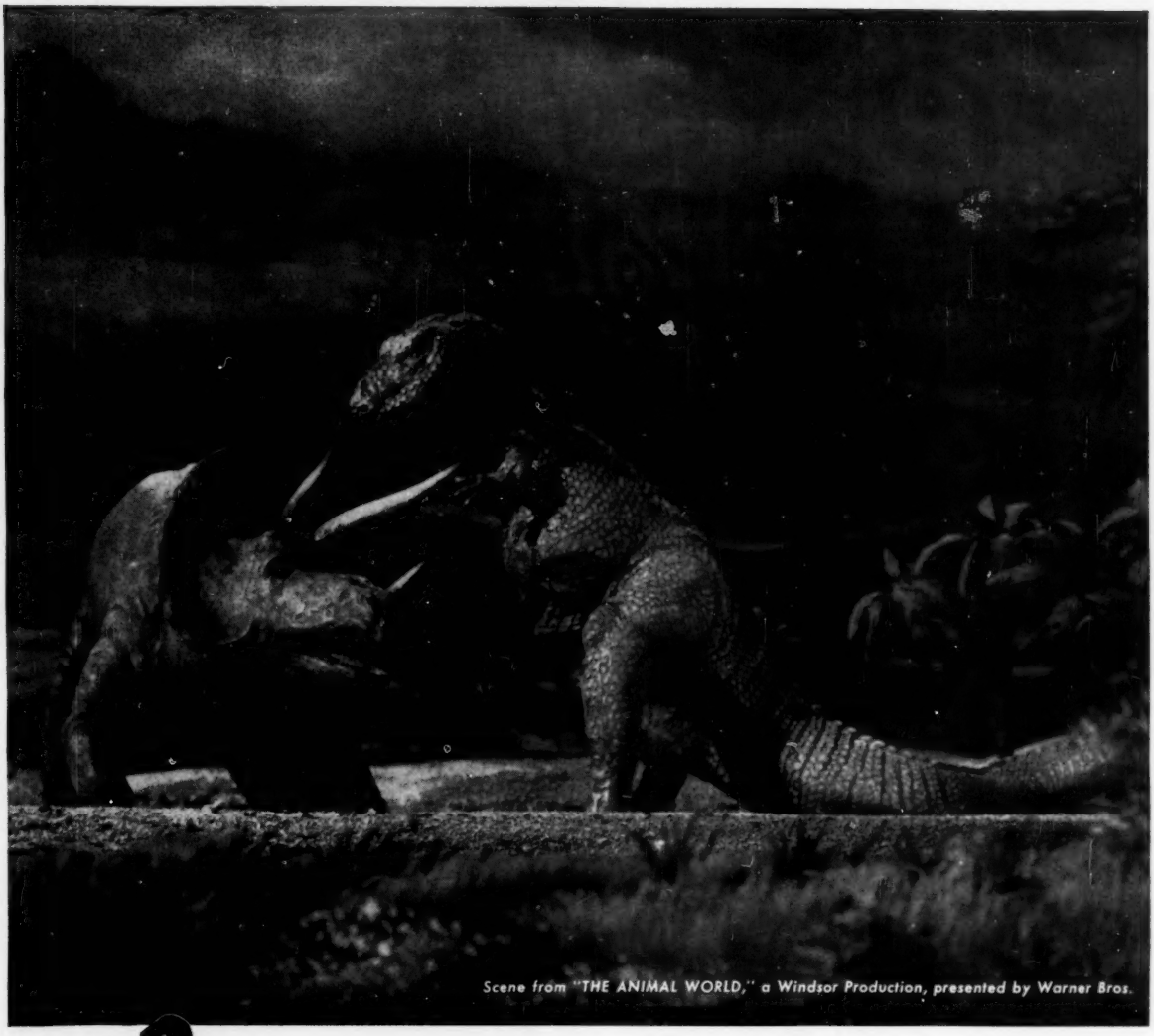

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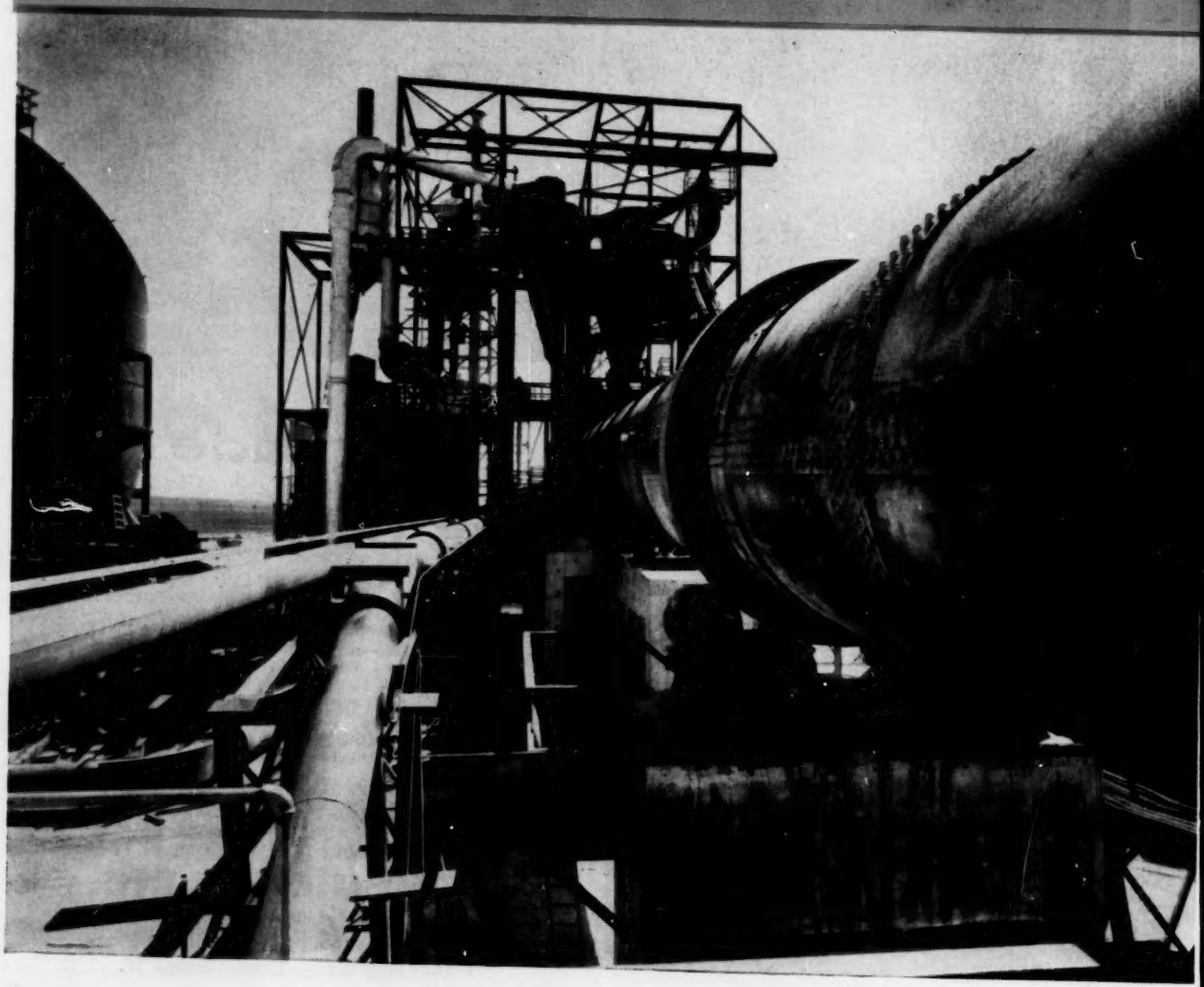

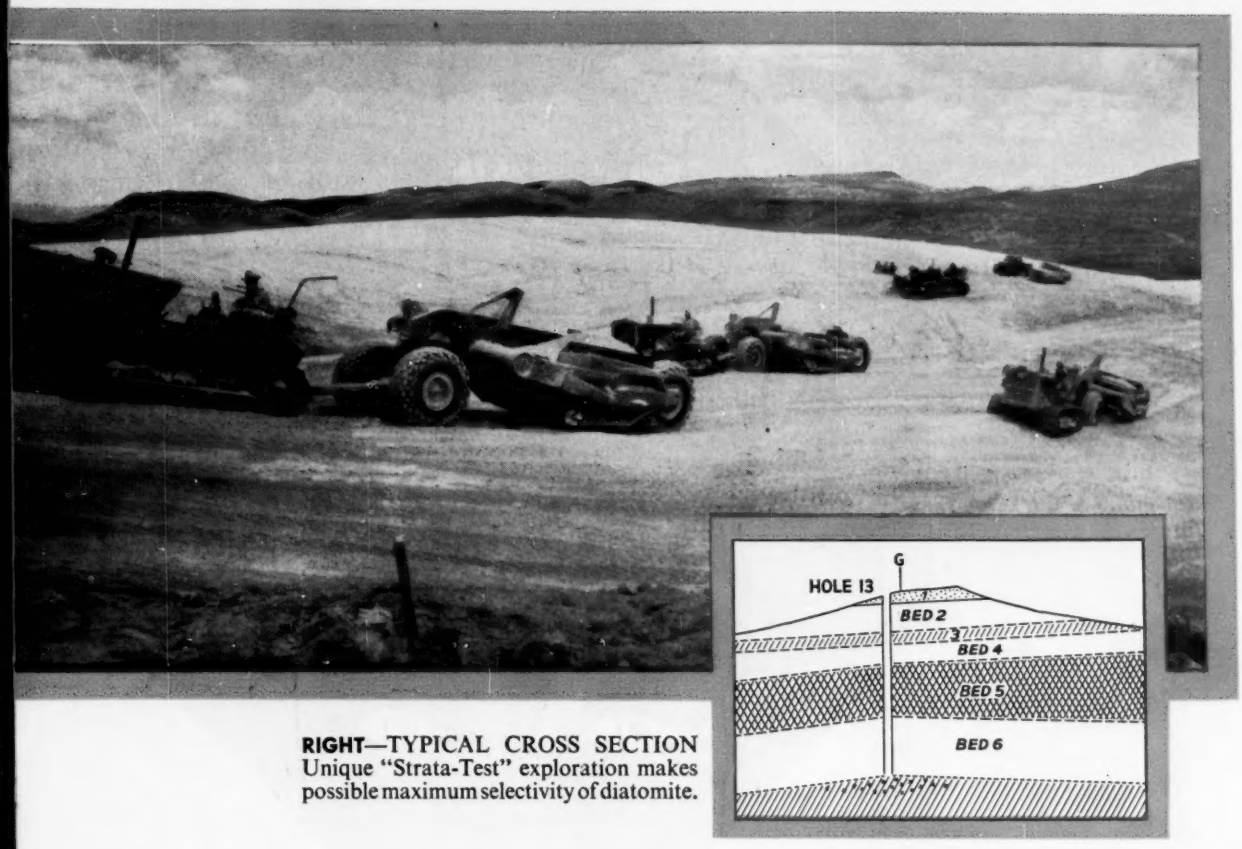

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In the exploration of these deposits, Eagle-Picher employed a unique "Strata-Test" method. Shafts were drilled 36-inches in diameter on 100-foot centers, to depths of more than 100 feet. From each of these shafts, at a maximum of 5 foot intervals, large samples of diatomite were secured for analysis. Each sample was taken to the Celatom Research Laboratory, carefully graded and its filtration performance characteristics recorded. This "Strata-Test" technique enables Eagle-Picher to selectively mine and stockpile the multiple grades of diatomite.

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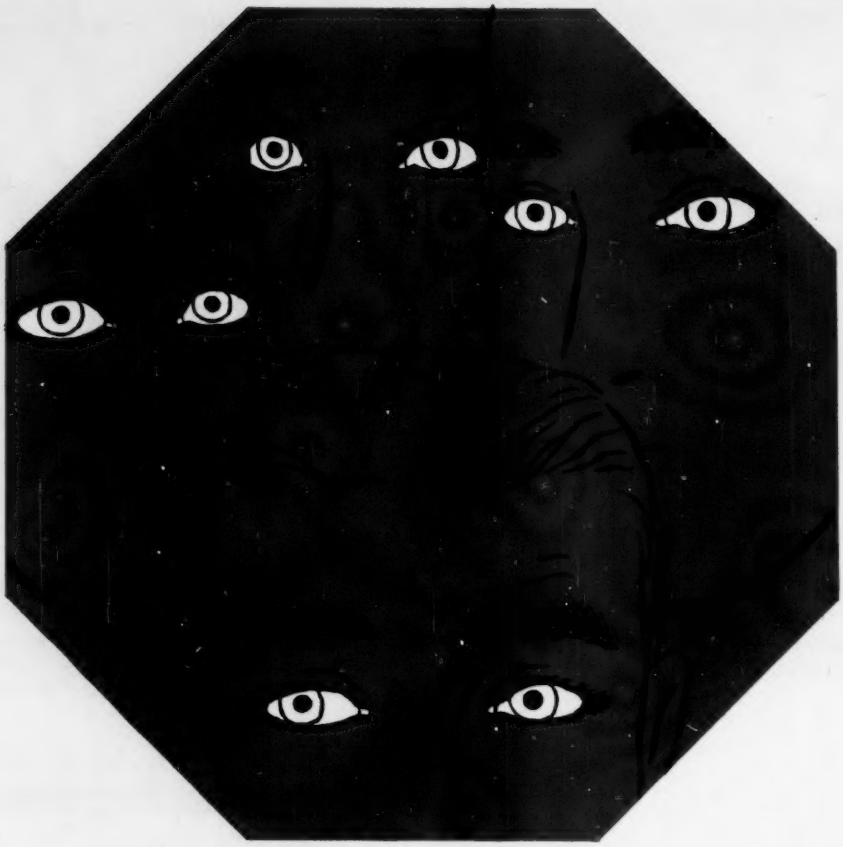

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VIEWPOINT

ADEQUACY of technical manpower is a subject that generates heated arguments. Some say that until the recent recession there was an alarming shortage; others contend that industry could have hired as many technical men as it was willing to pay sufficient salaries to.

It is not our purpose this week to weigh the pros and cons of the perennial debate. Rather, it is to contend that our increasing dependence on technology points toward a serious shortage some years hence, and that it is the obligation of industry—the chemical process industries in particular—to help avert it.

Twenty top U.S. businessmen have formed themselves into the Informal Committee for Corporate Aid to American Universities. They're about to beat the board-room bushes for funds because, as the committee says, "These corporations benefit . . . It is equitable . . . that such corporations should consider . . . repayment . . ."

Chemical process firms have not been niggardly in the past, of course. Many of them underwrite no-strings-attached fellowships; many contribute to local colleges, and in other ways contribute to institutions of higher learning.

But a strong case can be made for above-average chemical participation. Unlike many smaller industries, chemical firms needn't support a specialized technical institute, nor do they suffer the expense of lengthy on-the-job training programs. A Ph.D. chemist, for example, can move from his college lab bench to a firm's lab bench, carrying with him the knowledge and techniques he needs on his new job. A chemical engineer moves confidently from unit operations on the campus to unit operations in the plant.

In the colleges the chemical industry has a gratuitous wellspring of well-trained personnel. It's up to industry to keep the spring flowing.

H C E Johnson

Editor-in-Chief

LUMMUS

ENGINEERS AND CONSTRUCTORS FOR INDUSTRY

385 Madison Avenue New York 17, N. Y.

LUMMUS COMPLETES IN-PILE TEST LOOP FOR KNOLLS ATOMIC POWER LABORATORY

Engineering Development Center Handling Procurement, Construction and Off-site Operation of Test Loop

The Lummus Company Engineering Development Center, under a subcontract from Knolls Atomic Laboratory, has completed the procurement, construction, and off-site operation of a test loop to be used for irradiation testing by the Knolls Atomic Power Laboratory.

Lummus simulated the confinements of the area assigned to the facility. All out-of-pile equipment was erected, although the in-pile test section was simulated.

The facility consists essentially of a pressurized water heat exchange system and demineralizing equipment. Reactor fuel samples are inserted in the in-pile test section for study under controlled conditions of temperature, pressure and radiation.

Extreme care has been exercised during fabrication and erection because of the severe operating conditions encountered and the cleanliness required in all equipment subject to radioactivity.

The off-site testing consists of checking the functions of all process and control equipment, instrumentation systems, safety interlocks and alarms.

After completion of the test operation in early July, 1958, the equipment was dismantled and shipped to Idaho Falls. The dismantling was handled in a manner which facilitated re-assembly at the operating site, and Lummus provided the services of an engineer to coordinate this phase of the program.

The facilities of The Lummus Company Engineering Development Center in Newark, N. J. are uniquely suited to unusual projects of this nature. The necessary floor space, headroom, materials handling equipment, transportation facilities, and utilities are all available at the Center. Lummus' technical, maintenance, and operating personnel are all skilled in design, fabrication and operation of pilot plants and small scale process equipment. For more information write for our illustrated brochure No. 102, on the "Engineering Development Center."

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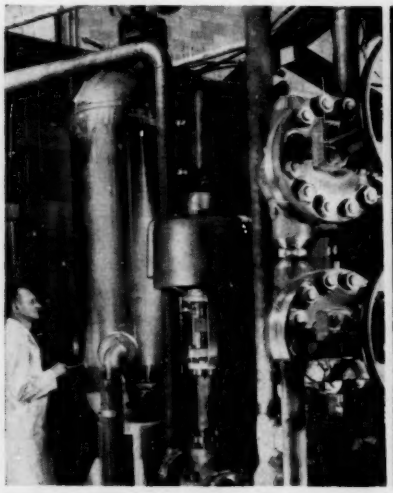
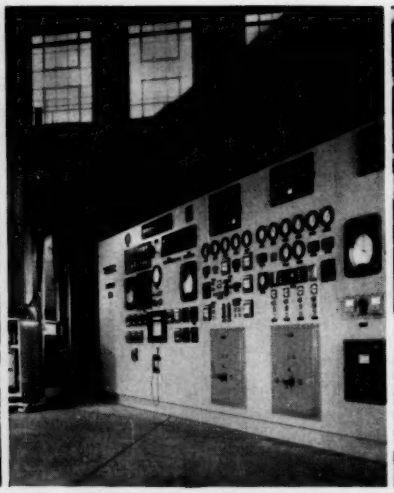


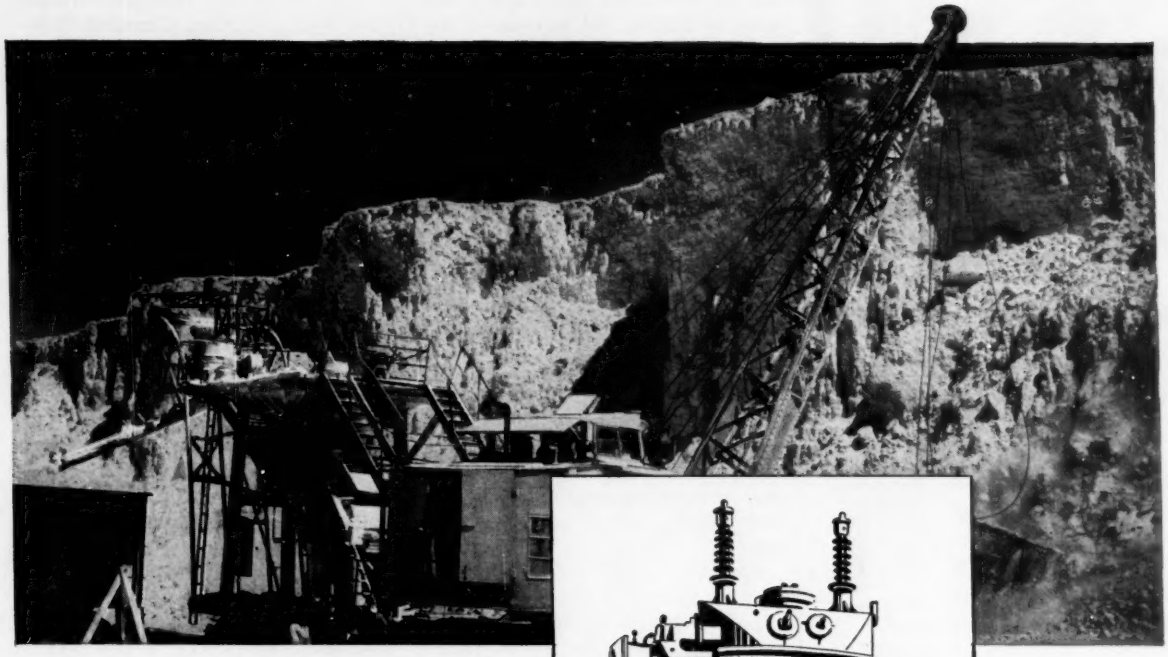
Pressurizer, main flow control valve, loop block valves.

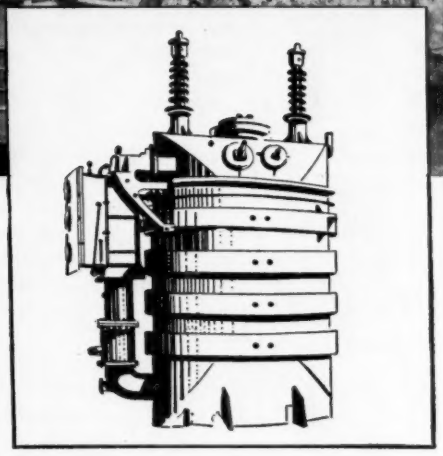


Test Loop Control Panel.

Loop pump volutes prepared with special cover plates for hydrostatic testing.

SULPHUR *helps to create Headline Products*





SF_6

A new concept in transformer insulation

GAS INSTEAD OF OIL... *that is headline news!*

Sulphur Hexafluoride is a heavy, non-flammable gas and is both chemically and physiologically inert. These characteristics plus its high dielectric strength pin-pointed the heavy duty transformer field as a logical target. And so it turned out!

SF6 instead of oil is now being used in high voltage transformers with the following advantages:

- operations are much quieter
- lighter construction permissible
- less restriction in location
- lower maintenance
- fire-proof and explosion-proof

In SF6, the electrical and electronics industries are finding a very useful product providing both electrical insulation and cooling. As in so many 'headline' products serving industry, the element S is part of the chemical structure!

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N.Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units
- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming

every size container of

TSP CHLORINATED

is the economy size

WHEN YOU ORDER THE BLOCKSON WAY

Combine your order for Trisodium Phosphate Chlorinated with other BLOCKSON chemicals. Do it the mixed car, mixed truckload way. It's popular with Blockson customers. They cut their costs to the bone and so will you. Write for our catalog.

125 lb. Drum

300 lb. Drum

In a hurry?

Whenever you're in a rush, just phone Joliet 2-6601, collect. Tell us the products and quantities you need. We'll speed your order to you.

100 lb. Bag

To keep production rolling with minimum inventories, use dependable BLOCKSON SERVICE

OLIN MATHIESON CHEMICAL CORPORATION
BLOCKSON

BLOCKSON CHEMICAL COMPANY
Division of Olin Mathieson Chemical Corporation
JOLIET, ILLINOIS

WAREHOUSE STOCKS AT BLOCKSON DISTRIBUTORS

OPINION

For Air Transportation

TO THE EDITOR: I enjoyed your article about the use of air transportation for chemicals (*Aug. 9, p. 87*). We have been using the services of Air Express for some time to great advantage. . . .

Our shipments are small in comparison with the bulk chemicals mentioned in your article; however, I see great possibilities for the whole field in such transportation.

GEO. T. SMITH
President
The Kleentab International Corp.
Austin, Tex.

Different Scales

TO THE EDITOR: We have read Charting Business *(Aug. 9)* with interest . . . and feel that your copy, while emphasizing the newsworthy gain in plastic packaging, treats the glass container story thoroughly and well.

However, through an inadvertence resulting from your using a smaller vertical scale for the chart of glass container shipments than for the plastic bottle shipments, we feel that you may have given to the one who "reads and runs" a less than accurate and fair picture of the growth of glass containers in the cosmetics field. . . .

R. L. CHENEY
Executive Director and
Marketing Manager
Glass Container Manufacturers
Institute, Inc.
New York

Rocket Old-Timer

TO THE EDITOR: In "Chemical Men Muster for More Moon Shots" *(Aug. 23, p. 21)*, you mention that nitrogen tetroxide has shown promise as an oxidizer for longer-range missiles. The impression is given that this material will be available from one producer in about four months' time. . . . Allied Chemical's Nitrogen Division has been producing this material in commercial quantities since 1941.

Shipments of nitrogen tetroxide for use as an oxidizer in rocket propellents were made [by Allied] as early as Jan. '47.

Since April of this year, shipments of nitrogen tetroxide have been made to the rocket industry in tank-car quantities. . . .

R. M. JONES
Director, Product Development Dept.
Nitrogen Division
Allied Chemical Corp.
New York

Large-Scale Desalting

TO THE EDITOR: For the past 17 years, this company has been principally engaged in manufacturing efficient, self-contained machines that produce pure fresh water for drinking, and other purposes, from both sea water and brackish well water.

These machines distill sea water by the thermocompression process, which is the most efficient method known today. Our sea-water distilling units are rugged, dependable pieces of equipment, manufactured in various sizes and designed for continuous operation.

Because of our experience and know-how, we have, for many years, been favored with what we believe to be the major portion of the world's commercial business in the field of thermocompression sea-water distilling units.

In view of the above, we were certainly disappointed when reading the water desalting article *(Aug. 30)* to find . . . we were . . . overlooked.

J. E. MURRHEE
Mechanical Equipment Co.
New Orleans

Our story was concerned with the commercialization of large-scale desalting, viz., over 1 million gal./day. Mechanical Equipment's commercial units range in capacity up to 50,000 gal./day.—ED.

MEETINGS

Fiftieth Anniversary of the Teaching of Rubber Chemistry; ceremonies establishing the Rubber Science Hall of Fame; University of Akron campus, Akron, O., Oct. 3.

Paint Industries Show, 1958, and annual meeting of the Federation of Paint and Varnish Production Clubs, Cleveland Public Auditorium, Cleveland, Oct. 6-8.

American Institute of Mining, Metallurgical and Petroleum Engineers, solid-fuels conference, Chamberlain Hotel, Old Point Comfort, Va., Oct. 9-10.

Packaging Institute, 20th annual forum, Edgewater Beach Hotel, Chicago, Oct. 13-15.

Welcome card

to buyers of

Anhydrous Ammonia and Nitrogen Solutions

A welcome card? Yes, indeed. Here's why:

1. This card is presented by a man from a company that backs up its salesmen's promises for delivery and for products that meet a customer's specifications.

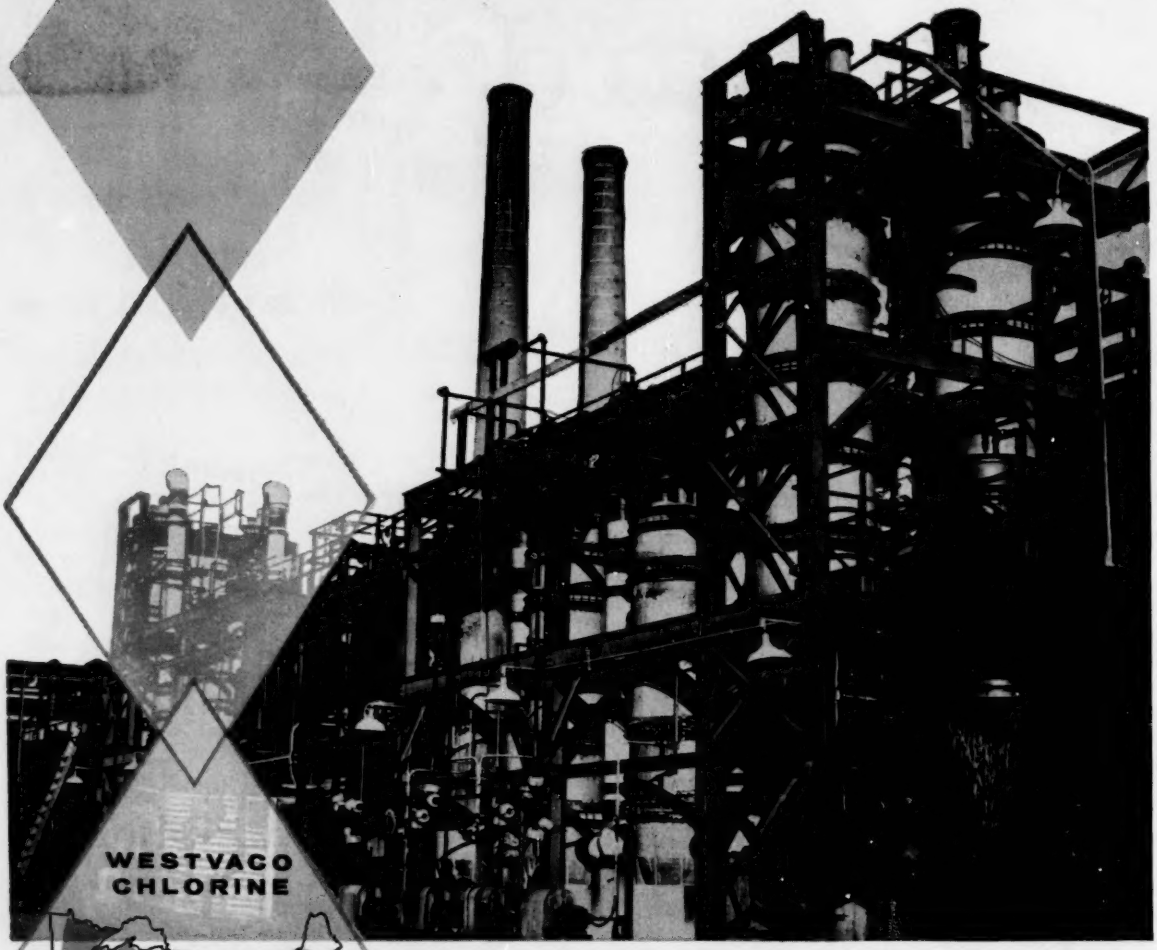
2. The customer doing business with Standard Oil knows he is buying from a company with an established reputation . . . a company he knows will give him fair treatment, service and product quality.

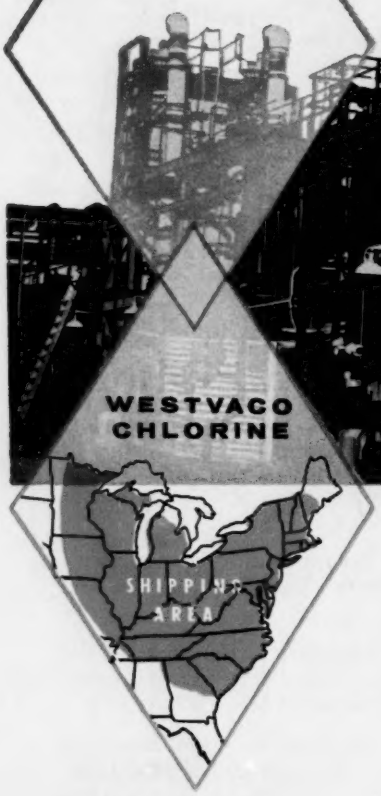
3. Standard's modern Ammonia and Nitrogen Solutions plant is located in the heart of the country's largest rail- and truck-shipping area. To a customer this means fast, sure deliveries . . . deliveries that can be easily controlled because routes are direct and distances short.

A modern plant capable of producing Ammonia and Nitrogen Solutions on specification. A supplier who knows a customer's requirements *and delivers*. These add up to service a Midwest buyer of Ammonia and Nitrogen Solutions can depend upon. Would you like a Standard Oil man to call on you? Write, wire or telephone Nitrogen Products Department, **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 5, Illinois.**

You expect more from STANDARD and get it!

"triple scrubbing" makes Westvaco® Chlorine pure and dry!





When high purity, low moisture chlorine is required, Westvaco should be among your first sources of supply. Nobody produces better electrolytic chlorine than you get from our "new" plant at South Charleston, W. Va.

As chlorine gas comes from the cells, it is "dried" and organic impurities removed in an efficient three-step scrubbing operation. Chloroform and chloroethylenes are present in Westvaco Chlorine only in low ppm. It's low in residual gases, too, which are reduced in cooling and liquefaction subsequent to scrubbing.

If you use chlorine anywhere in the East, mid-South or Midwest, pertinent data on Westvaco Chlorine should be in your files. Our nearest office will be glad to send you detailed product specifications and to quote on your requirements.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Westvaco Chlor-Alkali Division

General Sales Offices:
161 E. 42nd STREET, NEW YORK 17

Business
Newsletter

CHEMICAL WEEK
September 27, 1958

Chemical stocks are among the strongest in a developing "bull" market.

Besides their generally upward price trend, these stocks paid dividends totaling $24.1 million last month, according to data disclosed by Commerce Dept. last week; $23.3 million was the comparable total for August of '57. By contrast, stock dividends in all other manufacturing categories—with the exception of food, beverages and tobacco—were lower this August than in Aug. '57.

Taking advantage of the favorable market, Thiokol Chemical is offering 106,669 shares to stockholders on a 12-for-1 basis, at $42/share. Proceeds, approximately $4.4 million, will go for "general corporate purposes," says Thiokol.

It has budgeted $6 million for capital expenditures during 1958-59, including $4.5 million to expand its Utah division. Additional funds will come from retained earnings, future short-term borrowings, and "other methods."

•

Latest CPI earnings reports continue a mixed showing.

Vick Chemical boosted its 12 months' sales 13% over fiscal '57, to $107 million. Earnings of $10.1 million were up 28% for the same period.

American Marietta's sales for the six months ending Aug. 31 climbed 15% over the same period of '57, to $131 million. Profits rose to $9.1 million, a gain of 5.8%.

Two other companies fared less well:

International Minerals & Chemical's sales, reflecting first-half slumps in autos and construction, were $59.9 million, down 6.8% from the similar period of last year. Earnings of $3.7 million were 29% lower.

W. R. Grace, hit by lower exports, had sales of $164.5 million in first six months of '58, compared with $173.7 million in the '57 period. Profits dropped 48%, to $4.2 million.

Air Reduction is going ahead with its new polyvinyl alcohol plant at Calvert City, Ky., and a pilot plant at Bound Brook, N.J. Cost: $12 million. Completion date: '60.

Airco will use a manufacturing process licensed by Kurashiki Rayon Co. Ltd. (Osaka, Japan), which uses the resin to make Vinylon fiber. Airco also has U.S. rights to Kurashiki's fiber process. A separate fiber plant may be constructed later by a partner or by Airco itself.

•

Plans for Dow Badische's acetylene-derived chemicals plant are moving along. Site preparation is set to start within a month at Dow

Chemical's Freeport, Tex., plant and first construction due early in '59. Dow Badische was formed last summer as a jointly owned (50-50) subsidiary of Dow and Badische Anilin- & Soda-Fabrik Overzee, N.V., overseas arm of BASF AG. (Germany) (*CW Business Newsletter, July 12*). Capitalization: $6 million. President of the new company is E. B. Barnes, organic research director of Dow's Texas division.

•

And Dow is setting up a new overseas subsidiary in Caracas, Venezuela, to handle its growing international operations.

The wholly owned subsidiary—Dow Chemical International, Ltd., S.A.—will consolidate sales of Dow products and administer Dow's business interests and investments abroad. During the 12 months ending May 31, Dow's export sales rose to about 9% of the company's consolidated sales; and company President Leland Doan—who will serve as board chairman of Dow International—expects formation of the new subsidiary to further strengthen Dow's position in the world chemical market.

•

Hercules Powder Co. may be girding for expansion in Delaware.

The company has just optioned 1,800 acres along Delaware Bay, one mile north of Lewes. Hercules officials say the company has "no immediate plans" to build a plant but wants to be prepared for "possible future expansion in this area." A new production unit there would be the company's first in Delaware.

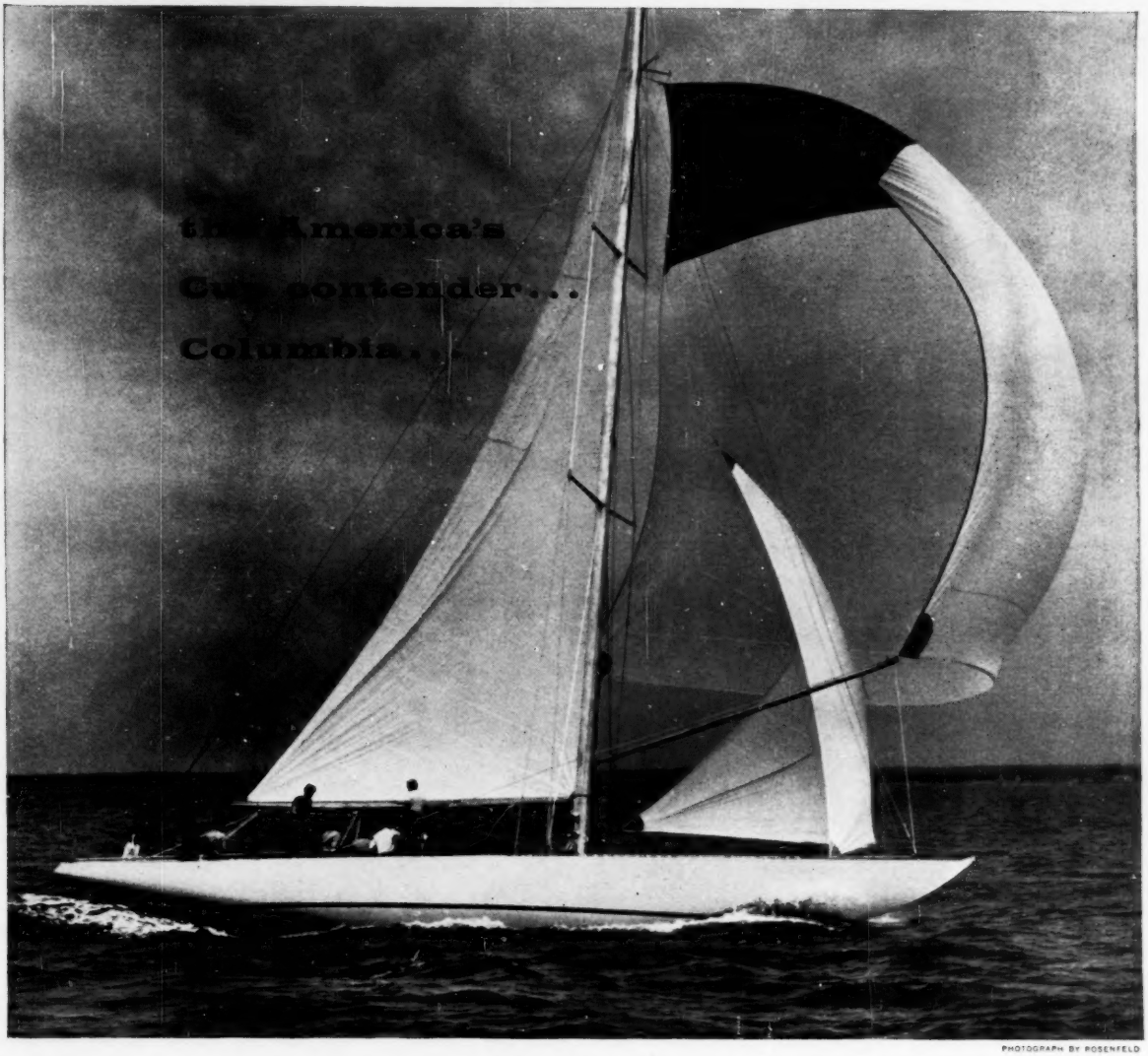
•

Chemical companies rank high in aid to education (*see p. 11*), a new survey by Council for Financial Aid to Education reveals.

The 24 chemical producers surveyed gave an average of 0.44% of net income to education in '56. That places them far above the 0.26% average of all 275 companies surveyed and second only to the 0.53% average scored by the textile group. Four of the chemical producers ranked among the 14 firms that gave more than 1% of their net income to education: Harshaw Chemical Co., International Minerals & Chemical Corp., Procter & Gamble, and Smith Kline & French. Their average: 1.26%. The chemical company gifts ranged from $1.7 million to $3,177, averaged $257,205, compared with the all-company average of $104,276.

•

Artistic creativeness is not smothered by scientific exactitude within the CPI. Out this week is a literary work by chemical engineer Edgar Bohle, formerly with Jefferson Chemical, now with American Cyanamid. In his debut as a mystery novelist, Bohle has written a story ("The Man Who Disappeared," Random House, $2.95) about industrial espionage and romance, involving the head of a research team in a top-security chemical plant.



PHOTOGRAPH BY ROSENFELD

Versamids from General Mills give the **Columbia** a lighter, water-free hull!

The 72 foot, 12 meter sloop *Columbia*, one of the principal contenders in the America's Cup Race, needed a hull coating that would (1) cut water absorption to a minimum, and (2) be more flexible and durable than ordinary coatings.

That's why Tarr & Wonson of Gloucester, Mass. called on the Versamid family of polyamide resins from General Mills' Chemical Division. They chose Versamid 115, because it *allowed* only 5% water absorption . . . and because of its amazing adhesion, flexibility, weather and salt-spray resistance!

Choose from 10 different Versamids . . . thermoplastic and thermosetting . . . for countless applications!

• protective coatings • potting and casting • adhesives (thermoplastic and hot melt) • concrete floor topping and patching • laminates • electronic applications

For further technical details, please write (and specify your application): Dept. CW-9, Chemical Division, Kankakee, Illinois.

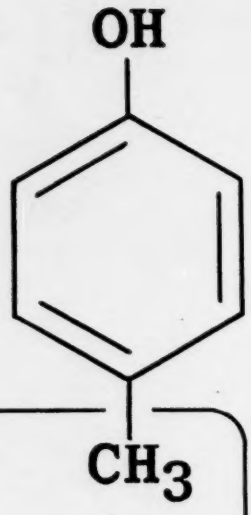
Fatty Nitrogens • Versamid Polyamide Resins • Sterols • Genamid Epoxy Curing Agents

CHEMICAL DIVISION

KANKAKEE, ILLINOIS

General Mills

HERCULES PARA-CRESOL



Typical Analysis

Purity	98+%
Freezing point	33.5°C.
Moisture	0.15%
Color of melt at 40°C.	1 Hellige
Specific gravity at 20/20°C.	1.035
Weight per gallon at 20°C.	8.6 lb.
Form	low-melting crystalline solid
Odor	phenolic and not sulfurous

Sales Information

Para-cresol is shipped from Gibbstown, N. J. and Hattiesburg, Miss. in tank cars and 55-gallon drums.

Oxychemicals Division, Naval Stores Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

NO57-7

Chemical Week

CW PHOTO—LIONEL CRAWFORD

At NICB annual meeting, marketing men hear forecast of size of the business recovery in '59.

Optimism—In the Experts' Forecast for '59

Cautious optimism was the order of the day for experts on the podium and management men in the audience at last week's annual marketing conference of the National Industrial Conference Board.

Supporting the optimism were firm convictions that consumer personal income was headed up, housing starts were increasing, consumer debt was now ready for expansion and that inventory buildup was soon to come. But preventing any burst of overrosy predictions were two big question marks: consumer confidence and capital spending.

For its annual peek at the sales future, NICB once again assembled a panel of top executives in New York's Waldorf-Astoria Hotel. Representing the chemical industry: Commercial Solvent's vice-president, W. Ward Jackson.

Chemical sales should expand about 10% in '59, Jackson says. Chemicals tied to the auto, home construction, steel, rubber, protective coatings and military industries should gain most.

Profits also will pick up, Jackson believes, but at a much slower rate than volume improvement. Much will depend on the industry's ability to operate at rates at least 85 - 90% of capacity. Cost reduction programs will also add to profits.

Clouding the profit picture, Jackson warned, are sporadic outbreaks of "panic pricing." Fertilizers, methanol, riboflavin, plastics and penicillin are moving at prices that produce risky profit margins. Another potential troublespot: strikes in key chemical industries.

Part of higher '59 sales and profits will stem from higher unit selling prices. The cost-price squeeze is now acute in fertilizer, solvent and petrochemical raw material industries. But, adds Jackson, the price jumps will "not be as rapid nor as extensive as the industry might desire."

Textiles: One of the best chemical customers, the textile industry, may be about to emerge from a long recession. This hope, says Burlington Industries treasurer, Charles F. Myers, Jr., is rooted in the smoothing out of the textile business cycle, industrial expansion and increasing home construction. Industrial applications consume about 23% of textile output; household fabrics, other household uses, 34%; apparel, 43%.

Largest per-capita apparel consumers are those in their late teens and early twenties. This portion of the population will rise by 15 million people by 1969. Moreover, Myers was markedly cheerful about prospects for heavy obsolescence in women's wardrobes. Textile sales, he predicts, will climb 4-5% in '59. And, since prices tend to firm during production spurts, textile price increases will average a relatively small 3-5%. Sounding a note of caution, however, Myers pointed to the inaccuracy of last year's forecasts.

Steel: Steel industry executives, and in particular Armco Steel's executive vice-president, Logan Johnston, are

predicting a 25% boost (to 106-108 million tons) in steel ingot production in '59. That will mean that steel producers will operate at about 75% of rated capacity. Johnston looks for physical construction volume to expand 3%; machinery, 5%; petroleum steel uses, about 6%; steel container demand, 5-6%; consumer appliances, 5%; steel for agricultural applications (machinery and construction), 5%; and automotive uses about 20%. Rising personal income will play an important role in boosting demand for steel consumer items.

Capital goods are the main softspot for steel. The next several quarters will be slow.

Motor Vehicles: Some 80 million lbs. of plastic materials (*CW, Nov. 9, '57, p. 80*) are now used annually in motor vehicle production. And if the predictions of Chrysler Vice-President Byron Nichols bear up, chemical venders to the auto industry can look for climbing sales.

Nichols is projecting '59 demand to fall between 5.5 million and 6 million cars, a sharp boost over '58 output of 4.6 million units. The favorable factors include a host of new styling and engineering features and thousands of postponed consumer purchases. Main problem, however, is consumer confidence. The public has the money, but the surveys indicate that consumers are awaiting more signs of economic recovery before they rush to purchase.

Petroleum: In tune with the general tone of cautious optimism was the estimate for the petroleum business by Tidewater Oil's vice-president, J. G. Jimenez. Despite a poor first half, '58 demand will exceed '57 demand by 1-2%. Although that's below the average 4% expansion in the past five years, oil demand will rebound in '59, show a 4-5% gain over '58.

Grounds for optimism: recently increased petroleum prices, seasonal demand for heating oil, a 4% hike in motor vehicle registrations and a corresponding 3-4% boost in gasoline demand and a 6% boost in industrial production that will stimulate crude oil demand by 5-6%.

Peering ahead to '65, Jimenez sees a 33%, 3-million-bbls./day boost in oil demand.

Construction: Avoiding overenthusiasm, the president of Turner Construction Co., H. C. Turner, Jr., told meeting attendees that total construction awards are now 25% ahead of '57, mainly the result of highway building. Although industrial construction awards have recently inched upward, they are still 40% off the '57 pace. Public awards will increase in '59 by as much as 5%. Housing and commercial construction will show, at best, only a slight gain. Industrial construction awards for '59 will be only 10-20% behind '58's. Corporate planners, he adds, can look for higher bills—perhaps as much as 3-5% over '58's.

Nonferrous Metals: Inventory reductions of nonferrous metals, asserts *Daily Metal Reporter* Editor-in-Chief Joseph Zimmerman, have reached the nadir; important indices for metal forecasters are all turning upward. Price books on major nonferrous metals will show little change in '59, although some scattered increases may occur. But price increases may come sooner—and be sharper—if the government increases stockpiling activity or imposes higher import duties.

Machinery and Equipment: Badly battered by the downtrend in capital spending, machinery and equipment sales will stage a partial recovery next year. It's the expectation of Albert S. Burgoyne, vice-president of manufacturing for the E. W. Bliss Co., that industry sales will increase about 4.2% next year ('58 orders are running 15% behind '57, '59 orders will be 8% below '57's). Restraining further increases are rising imports and overcapacity throughout American industry. Burgoyne estimates that industrial production is currently only about 70% of capacity and that industry will not expand further until it is operating at 85-90% of capacity. Burgoyne predicted that the pressure point (85%) won't occur until '60. And a significant upswing in capital goods may have to wait until '61. More hopeful is the long-term outlook. In "constant" '57 dollars, he projects a 51% increase (to $45 billion) by '67. But for the year ahead, the major market will lie in replacement. And that, he adds, will take plenty of hard selling.

Many of the other panelists took a similar slant. Business in '59 will be better but it won't be realized by mere ordertaking. Hard selling will remain the key to improved sales in '59.

Secrets Suit Riposte

Pretrial maneuvering in Monsanto's phosphorus-trade-secrets suit against Central Farmers Fertilizer Co. (CW, Aug. 9, p. 24) took a surprise turn last week. In an apparent attempt to turn the tables on Monsanto, the Chicago-based farmers' co-op concern filed a counterclaim in the federal district court in Boise, Ida.

The charge: that Monsanto is scheming "to create a monopoly in the manufacture of elemental phosphorus" by requiring its employees to sign contracts not to divulge trade secrets and by suing Central Farmers and others.

Punitive Damages Asked: These actions, Central Farmers charges, have resulted in its being "frustrated, retarded, injured and damaged" in the construction of its elemental phosphorus unit at Georgetown Canyon, Ida. CFF seeks judgment against Monsanto of $100,000/month "so long as this action pends and defendants suffer damages," plus $500,000 in punitive damages, an injunction restraining Monsanto from alleged acts. The court will probably hear the plea this week.

Last month, Monsanto won a clear-cut victory in its Salt Lake City suit against ex-employee Charles Miller.

Full Trial Ahead: Central Farmers' plea anticipates the upcoming trial in Pocatello of Monsanto's suit against it and codefendants Miller and F. C. Torkelson Co. (Salt Lake City), former design engineers on the Georgetown Canyon project.

The charges, Monsanto asserts, "are baseless . . . Monsanto will resist them with all possible vigor." The company points to Judge Cristenson's finding that "one of the primary and motivating purposes that Central Farmers had in the employment of Miller was to obtain through Miller confidential information concerning Monsanto's design and experience . . ." To the monopoly charge, Monsanto rebuts: "It is common knowledge that ever since it has been in the business, Monsanto has had to compete and must now compete with several eminently successful elemental phosphorus producers."

In its latest annual report, Monsanto estimates that it accounts for about 34.6% of U. S. phosphorus production as of the end of the year.

Spencer's G. M. Jenkins, wife.

SCI's President Smith applauds successor Sir Robert Robinson.

Past President Julian Leonard.

CW PHOTOS—JOSEPH KARP

Topping a Ten-Day Tour

The reception shown in these pictures was one feature of a round of banquets, technical sessions and plant tours comprising the Society of the Chemical Industry's 68th annual meeting—a 10-day excursion through various Canadian cities, ending this week. Between its formal events, the meeting provided opportunities for executives to get together for private talks that are likely to affect chemical industry decisions in three nations.

At this gathering of the world's top English-speaking chemical executives, Nobel Prize winner Sir Robert Robinson, introduced as the "outstanding chemist of his time," was formally elected new president. Robinson—a director of Shell Chemical Ltd. (England)—succeeds H. Greville Smith, president of Canadian Industries Ltd. The Messel Medal, given by SCI each year for "meritorious distinctions in science, industry or public affairs," was presented to C. D. Howe, former Canadian Minister of Trade and Commerce.

Next day, delegates journeyed to Toronto for more technical sessions and plant tours and the presentation to Fred Emmerich, Allied Chemical's retired board chairman, of the SCI American division's medal for "conspicuous services to applied chemistry."

Details of private exchanges, of course, are purely conjectural—but some results of this informal idea-swapping are likely to be felt before next year's SCI meeting, in Glasgow.

The Foster D. Snells finish reception line greetings at cocktail party before full-dress banquet.

Bigger Bet on Acetic

Continuing to put most of its expansion money into chemicals and plastics, where its sales growth has been the greatest, Celanese Corp. is embarking on a multimillion-dollar project that will double acetic acid capacity at Pampa, Tex.

When completed, the project will give the company more than 25% of total U. S. capacity for this product.

Wall Street reaction was apparent. Celanese stock was one of the 10 most actively traded securities on the New York Stock Exchange two days running last week, and its price mounted to a high for the year of $21/share.

Addition of the new facilities—scheduled to begin this year and to be completed by late 1959—will enable the Pampa plant to produce 240 million lbs./year of acetic acid, according to Richard KixMiller, Celanese vice-president and general manager of the company's Chemical Division. Celanese also produces acetic acid at Bishop, Tex.

Acetic is consumed in quantity by the company's plastics and textile divisions. It goes into production of such long-established items as cellulose acetate, vinyl acetate, acetic anhydride and numerous intermediates. And part of the swelled output will be funneled into production of two newer Celanese products — trimethylolpropane (for making polyurethane foamed plastics), acrylate esters (for paints, coatings).

For Lithium—Research

The paramount role of research in the lithium industry's drive for nonnuclear markets was stressed last week by its two largest producers.

At a reception in New York, Lithium Corp. of America's Harry Feltenstein, Jr., financial vice-president and general manager, told *CW* his company will boost research outlay 75% next year. Occasion for the reception: the company's admission to trading on the American Stock Exchange.

And in Philadelphia, Foote Mineral Research Director E. M. Kitt told securities analysts that since he joined the company last year, Foote has increased its research staff nearly 50% (from 60 to 89), and plans to continue the buildup.

Both companies consider research the key to commercial markets, which they see as potentially "vast," but which now provide less than half of lithium sales for all four producers. The bulk of lithium profits comes from lithium hydroxide sales to the Atomic Energy Commission. These AEC contracts expire next year, but are likely to be extended.

After extracting lithium-6 isotope, AEC sells the hydroxide back to the producers. Excessive inventory resulting from this arrangement precipitated last December's 27% price slash (*CW, Dec. 21, '57, p. 20*). Since the first of this year, however, said Lithium Corp. President Herbert Rogers, AEC sells back only what the companies need, and prices have moved up to 75¢/lb.

For Lithium Corp., research will center on metallurgy (in which the company sees the brightest future for the metal) and organic products. Fuels are another important bet. Lithium Corp. is retaining an outside research organization to carry on high-energy fuel studies, and has exchanged letters of intent with Astrodyne, Inc., on proposed joint research.

Foote is zealous about lithium's further possibilities in organic catalysis.

The potential for their product, both firms agree, is "virtually untouched."

Snell: Buying, Building

With business notably improved, Foster D. Snell, Inc., confirmed last week that its plans include building one new lab, purchasing another.

Interviewed at last week's Society of the Chemical Industry meeting in Montreal (*p. 23*), Foster D. Snell, president and chairman of the consulting firm, said further acquisitions will depend on the extent of the upturn. Referring to an American Institute of Management report that criticized the company's financial policy as one of "too much money in the bank," Snell remarked: "They may be right. Actually, we're going to spend more money. We just want something worthwhile for it."

Snell then described several small firms the company had thought of buying but later turned down because analysis showed the deals wouldn't be profitable. But he disclosed that negotiations are almost complete for purchase of one "good-size" laboratory and that the company is now building a medicinal lab in Baltimore, Md., to replace an existing one.

Insecticide Incentive

In a step that may speedily bring high-volume sales for a pair of new agricultural chemicals, a prominent Midwestern meatpacking company is offering to pay Iowa cattlemen directly for treating their livestock with systemic insecticides to kill cattle grubs.

The offer: up to $1/head on the cost of treatment to any cattleman who delivers successfully treated cattle—not more than four grubs per animal—between Dec. 1 and May 1, '59.

It's obviously a profitable deal for all parties. The cattlemen not only will recover something like two-thirds of the cost of treating their livestock but also will realize an extra $5 or so on each steer marketed. The meatpacker—who wants to remain anonymous for the time being—will easily recoup the $1/head, since, he says, there will be more pounds of higher-grade meat and a much more valuable hide to be sold. And the offer is sure to spark insecticide sales for Dow Chemical and Chemagro Corp., makers of the two recommended grub-killer products.*

Another factor that will tend to boost usage of these insecticides: the possibility that organized, county-wide action could virtually eliminate the cattle grub menace in any community within about two years. Treatment has been shown to kill 95-100% of the grubs on each animal, leaving few or no larvae to mature into egg-laying heelflies.

Aiming at complete eradication by this plan, the beef producers' association and the extension council in one central Iowa county are launching a drive to get all beef cattle in the county treated between now and Dec. 15.

At least three other Iowa meatpackers are understood to be considering similar offers for effectively treated cattle, according to entomologist Earle Raun of Iowa State College. And if this strategy works out well for these meatpackers, there would be good precedent for parallel plans based on any or all of the many ways in which chemicals can add value to farm crops and livestock.

* Dow's Trolene—first marketed as ET-57 (*CW, March 2, '57, p. 50*)—is administered as a pill or bolus; Chemagro's Co-Ral is sprayed on cattle.

COMPANIES

Union Carbide Canada Ltd. (Toronto) will again begin construction of an 11-story headquarters building in Toronto. An estimated $600,000 loss occurred when structural steel framework for the building collapsed Sept. 6. After investigations into causes of the accident are completed, building will be resumed, with an anticipated six-month delay in occupancy, originally set for Oct. '59.

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National Aluminate Corp. (Chicago) has acquired Oil Products & Chemical Co., Inc. (Chicago). Oil Products, which will operate as a division of Nalco, produces metal-working lubricants.

•

Signet Distilleries, Ltd., has stopped construction of its 27-million-gal./year alcohols plant in Saskatoon, Sask. (*CW, July 13, '57, p. 25*). Building of the plant which had been scheduled to go onstream at the end of this year, may be resumed when new financing plans are completed.

•

Susquehanna Corp. (Chicago) will not acquire Vitro Minerals Corp., for which it has been negotiating (*CW, Aug. 30, p. 14*). Owners of Vitro Minerals—Vitro Corp. of America (New York) and Rochester & Pittsburgh Coal (Indiana, Pa.)—said the resulting Susquehanna proxy fight prompted their decision.

•

Union Bag-Camp Paper Corp. (New York) is negotiating to acquire outstanding stock of Universal Paper Bag Co. (New Hope, Pa.). The Pennsylvania firm makes multiwall paper bags.

EXPANSION

Herbicide: Stauffer Chemical Co. (New York) will build a plant in Richmond, Calif., to produce a selective herbicide, ethyl di-*n*-propylthiolcarbamate. The multimillion-pound-capacity plant will go onstream by Jan. '59.

•

Petrochemicals: Union Carbide Chemicals Co. (New York) will expand in esters and alcohols with two new units (capacity: more than 100 million lbs./year) at Seadrift, Tex. The plant now produces ethylene oxide, glycols and polyethylene; the company's line of alcohols and esters has been produced elsewhere. Completion date of new units: 1960.

•

Phosphorus: Monsanto Chemical Co. (St. Louis) has increased phosphorus production at its Soda Springs, Ida., facility. A 30,000-kw. electric furnace has been put back on line after a six-month shutdown. The company has also cleared legal and financial hurdles to begin construction of an 11-mile private road from quarry to the reduction center.

Industrial Gases: Linde Co., division of Union Carbide Corp. (New York), will build a plant at Huntsville, Ala., near Redstone Arsenal, to produce oxygen, nitrogen and argon.

FOREIGN

Synthetic Fiber/Great Britain: Calico Printers Assn. showed a net profit of $1.7 million in preliminary '57-'58 earnings tallies. Nearly half of its profit, $840,000, resulted from royalty income on Terylene and other patents. The association's patents on Terylene, which it licenses to ICI, were provisionally due to expire in June '58, but patent extension applications are pending.

•

Chemicals/Austria: Donau Chemie AG., third-largest Austrian enterprise, will soon be restored to private ownership. The firm, which was seized by the Russians in 1945 under provisions of agreements of the Potsdam Conference, was purchased by Austria from the U.S.S.R. after the '55 Austrian State Treaty.

•

Petrochemicals/Egypt: The General Petroleum Organization, Egypt's prime oil authority, has formed three committees to study the petrochemicals industry. The groups will consider possibilities for syndet production, raw material use of natural gas, and plastics and rubber polymer production.

•

Butanol/India: The Organic Chemicals Division of Hyderabad Construction Co. will manufacture butanol in Andhra under a recently awarded government license. The firm is negotiating with a Swedish firm to operate the plant. Initial capacity: 4 tons/day.

•

PVC/Poland: Russian machinery has received the blame for production breakdown at the "show-off" Oswiecim polyvinylchloride plant in Poland. When the plant went onstream in late Nov. '57, capacity was set at 6,700 metric tons annually. Breakdowns of Russian-made machines not backed by spares or spare parts slowed output to 2,000 metric tons in first nine months' production.

•

Formaldehyde/Germany: Reichhold Chemie AG. will produce formaldehyde in a new 10-million-lbs./year plant at Hamburg, West Germany. The company is an affiliate of Reichhold Chemicals, Inc.

•

Nuclear Power/Switzerland: Westinghouse International Atomic Power Co. has been established in Geneva to service the expanding European nuclear power markets. Associated with several other European companies, including Fiat (Italy) and Siemens (Germany), the subsidiary of Westinghouse Electric International Co. will look for business from the Euratom program.

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Washington
Newsletter

CHEMICAL WEEK
September 27, 1958

With the November elections fast approaching, Washington is keeping a sharp eye on the changing economic climate.

Here are the key figures: second-quarter after-tax profits of manufacturing as a whole rose 15% over the second quarter, while sales of durables and nondurables rose 3%. Durables' 21% profits were slightly more than double the 10% increase registered for soft goods.

Chemical process industries all shared in the general profit and sales rise. Exceptions were petroleum refining and related industries, whose profits slipped another 6% because of continued falling off in sales.

The stone, clay and glass industries showed the biggest improvement of any manufacturing group both within and without the CPI. Their profits almost tripled as sales increased 17%.

Chemicals and allied products industries scored a 13% profit gain for the second quarter and a 9% sales increase. Drug manufacturers' profits were down another 12%, however, reflecting further sales drops. Rubber manufacturers' net profits climbed 19%, sales 9%. Paper manufacturers increased sales only about 1%, but their profits jumped 13%.

•

Washington keeps jockeying on aid to the nonferrous metals industry. The latest development is the changed attitude of the White House on tougher import restrictions on lead and zinc: the Administration has indicated it's about to go along with long-standing Tariff Commission recommendations for tougher import restrictions on the two metals—if not their ores and concentrates—in the form of temporary quotas, higher duties, or both.

Government officials are still pushing for production and export controls as they did at the UN lead-zinc conference in London. But things have been going slowly because Canada—a major exporter—has been cool to proposals of an international agreement on lead and zinc.

GOP politicians now have convinced Eisenhower's aides that he should take emergency steps to cut imports—to help out in the November elections. They say they need this kind of action to help GOP chances in Western states.

•

Methods of detecting small residues of pesticides on fruits and vegetables is one of many topics to be explored at a three-day meeting of Assn. of Official Agricultural Chemists, beginning Oct. 13 in Washington.

The meeting brings together scientists working for federal and state law enforcement agencies and scientists employed by private industry.

Special emphasis of the pesticide papers will be on rapid techniques to find over-all contamination. Improved analysis is expected to ease enforcement aimed at ensuring that no more than tolerance levels of

Washington Newsletter

(Continued)

almost 100 chemicals, established by Food & Drug Administration, remain on fruits and vegetables.

•

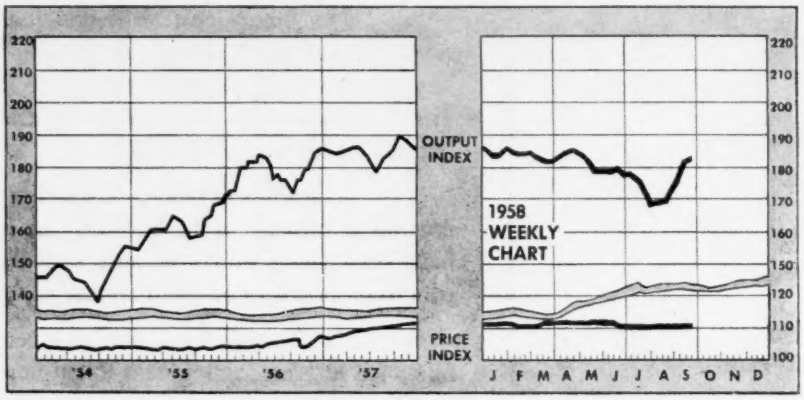
Another government-industry air pollution meeting gets under way Nov. 18 in Washington. Sponsored by U.S. Public Health Service, the national conference on air pollution will take a good look at current air pollution problems and the outlook for the next 10 years. It's a sort of midway appraisal—appropriation authority under the federal air pollution act of '55 expires in '60.

•

Securities & Exchange Commission will tighten the rules on stock transactions involving nonresidents and deals resulting in mergers.

Under a proposed new regulation, reports by brokers will be required on any significant stock transactions they make for foreign accounts. The commission wants closer rein on deals in which stocks are distributed in the U.S. without being registered first with the commission. Now, the commission finds out about such major deals only accidentally. The new rule would arm the commission to control distribution of unregistered stocks.

Its legal weapon: an injunction to bar any U.S. broker from participating in distributing unregistered stock. Deadline for comments on the proposal is Oct. 15.



Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	184.0	181.0	185.0
Chemical Week wholesale price index (1947=100)	110.6	110.7	111.1
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	45.47	45.10	42.36

MONTHLY Trade (million dollars)	Manufacturers' Sales: Latest Month	Manufacturers' Sales: Preceding Month	Manufacturers' Sales: Year Ago	Manufacturers' Inventories: Latest Month	Manufacturers' Inventories: Preceding Month	Manufacturers' Inventories: Year Ago
All manufacturing	26,290	25,747	27,030	49,812	50,246	54,093
Chemicals and allied products	1,998	1,899	2,008	3,711	3,747	3,728
Petroleum and coal products	2,789	2,682	2,991	3,312	3,348	3,494

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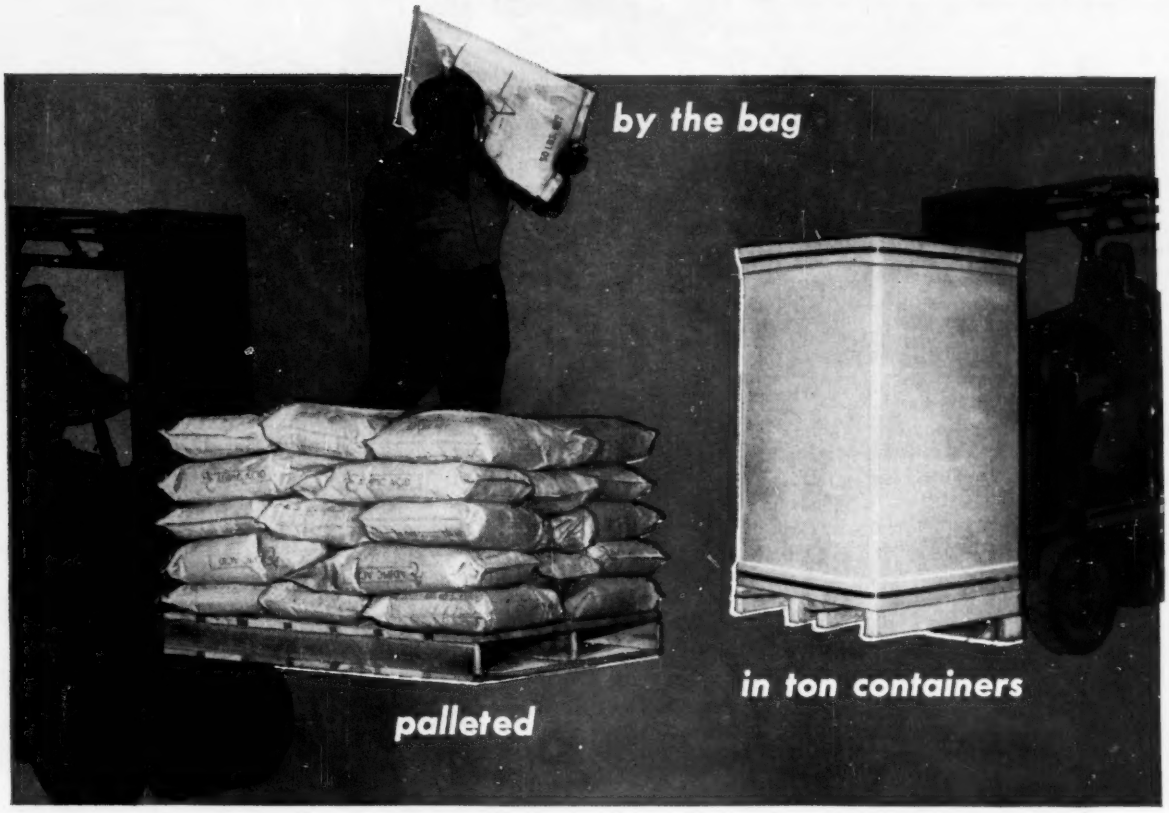

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by the commission with respect thereto shall be given to the public; provided, further, no rule or regulation shall be adopted unless a need for such action is shown [illegible] ance of th[illegible] hearing.

History.—Co[illegible]

403.10 [illegible] shall cont[illegible] the rules and regulations adopted and promulgated by the commission and for this purpose shall have power to:

(1) Conduct and [illegible] grams for [illegible] causes, effe[illegible] and hazards of air pollution;

(2) Conduct and supervise state-wide programs of air pollution control education including the preparation and distribution of information [illegible] to air pollution control;

(3) [illegible] gaged i[illegible] pollution [illegible] filing of reports by them containing [illegible] tion relating to location, size of outlet, height of outlet rate and period of emission and composition of effluent and such other informa[illegible] as the board shall prescribe to be filed rela[illegible] to air pollution. The requirement for filin[illegible] reports shall b[illegible] consent of the [illegible] which may result in air [illegible] tion of the board which direction may [illegible] only after a hearing upon notice to th[illegible] engaged in such operation.

(4) Enter and inspect any building [illegible] except private residences, for the pur[illegible] investigating an actual or suspected source of [illegible] ipal government or from private sources for the study and control of air pollution.

[illegible]p. §10, ch. 57-369.

[illegible]earings.—Any hearing held before [illegible]sion under the provisions of this [illegible]l be held before five or more mem[illegible]ommission designated by the chairman and any member shall have the power to [illegible] witnesses and compel their attendance, a[illegible] and require the production for examination [illegible] ex-cluding financial records, relating to any matter under investigation in any such hearing. [illegible] information as to secret processes or methods of manufacture or production shall not be disclosed in public hearing before the commission [illegible]cticable and shall be [illegible]

[illegible]History.

403.12 Creation and dissolution of districts, [illegible] final decision.—The commission may [illegible] and create within the state such air [illegible] districts as are necessary for the prevention of air pollution as herein defined, to consist of one [illegible] or [illegible]

403.10 Board; functions, powers.—The board shall control air pollution in accordance with the rules and regulations adopted and promulgated by the commission and for this purpose shall have power to:

(1) Conduct and supervise research [illegible]

(2) Conduct and supervise state-wide programs of air pollution control education [illegible]

(3) Require the registration of persons engaged in operations which may result in air pollution in any air control district [illegible]

(4) Enter and inspect any building or place, except private residences, for the purpose of investigating an actual or suspected source [illegible]

(5) Receive or initiate complaints of air pollution, hold hearings in connection with air pollution and institute legal proceedings [illegible]

403.18 Injunctive relief; penalty.—If such preventive or corrective measures are not taken in accordance with the order of the commission, the commission may institute proceedings in any court of competent jurisdiction for injunctive relief [illegible]

Florida's new antipollution law puts muscle behind public cries for curb on industrial pollution.

Pollution Law Pulls Phosphate Makers' Ace

A three-year study sponsored by seven Polk County, Florida, chemical companies to determine the facts about alleged air pollution from phosphate production is under way this week.

Their action comes amid official cries for industry funds to support air pollution studies and creation of state and local pollution control bodies. Complaints have already fostered a major air pollution damage suit and adverse public opinion.

The seven firms are Armour & Co., Coronet Division of Smith-Douglass, Davison Chemical, F. S. Royster Guano Co., International Minerals & Chemical, Swift & Co., Virginia-Carolina Chemical. Their attorneys have employed Resources Research, Inc., to find out to what extent, if any, triple superphosphate production is polluting the air, damaging crops and cattle. Louis McCabe, former scientists' director, of the U.S. Public Health Service, who now heads Resources Research, has established a new laboratory at Lakeland, Fla., to conduct the study.

Expensive Program: The seven sponsors—all named in a $500,000 air pollution damage suit filed last year in federal district court at Tampa by cattleman Doyle Acree *(CW, June 21, p. 112)*—reportedly are paying $50,000 each for the study, although together they have already spent millions of dollars for equipment to control air pollution.

Eugene Krackow, recently named as a member of the U.S. Public Health Service's civilian technical committee on air pollution medical research and formerly with the Army Chemical Corps as a toxicological expert, is in charge of Resources Research's Lakeland staff of 12 scientists and technicians. In addition to the laboratory building, the research company purchased 22 acres of land to be used for future expansion (it will do other pollution studies, will also work on fresh-from-salt-water projects).

Krackow told *CW* that his organization will try to find, by analyzing many plant and animal samples, whether phosphate production causes dangerous pollution. Cattle and their food will be examined; Spanish moss

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—regarded as a good "catcher" of poisonous elements—will be studied; citrus leaves will be checked.

Fluorine Is Suspect: Fluorine is suspected as the element that might be responsible for alleged damage to crops and livestock. Resources Research will attempt to find out.

Its project follows much clamor for such an investigation. The Citizens Committee on Air Pollution, headed by E. N. Lightfoot, and various fruit growers and cattlemen are still demanding that the state take action to prevent damage believed to be caused by fluoride fumes. Urging that Florida appropriate more money for a pollution study in Polk County, Lightfoot said that eight years ago the phosphate industry in the county was essentially a mining operation, but that today it's a process industry releasing "toxic elements" into the atmosphere.

The state has already taken some pollution control measures. Last year, the legislature set up a nine-man control commission to handle a broad antipollution law *(picture, p. 31)*. More recently, the Polk County pollution district was established.

The state's Air Pollution Control Commission, headed by Henry Lipscomb, asked for additional funds, but Gov. LeRoy Collins turned down the request, suggested that the phosphate industry should carry at least part of the financial load of discovering the facts about pollution.

Accumulating Evidence: Earlier this year, the state commissioners toured Polk County phosphate plants, farms and orchards. They reported striking examples of what appeared to be fluoride-caused maladies. These included range cattle suffering from advanced symptoms of tooth rot and leg and rib nodulation (small knots or knobs adhering to the bone). A veterinarian explained to the group that such conditions are called clinical fluorosis, result from too great a fluoride intake. Commission members also reported irregular outbreaks of orange and grapefruit leaf chlorosis (a diseased condition in plants, indicated by blanching of green parts), said to result from fluoride. Hardest hit were groves in the vicinity of the triple superphosphate plants.

Engineers and chemists at the plants visited by the commissioners demonstrated steps in fertilizer and plant scrubbing that reduce gaseous flu-

oride compounds. Chairman Lipscomb said at the time of the tour that his group wasn't on a "witchhunt" and wasn't sufficiently advised "as yet" to assess blame for the conditions.

Cyanamid Not a Sponsor: American Cyanamid's Brewster plant—a major phosphate producer in the county—is not a sponsor of the Resources Research study. According to Cyanamid sources, the company did not participate because its own antipollution program had been in effect over a year when the research firm was called in. Cyanamid was not named in the $500,000 damage suit because the Brewster plant was not in operation at the time the damages alleged in the suit occurred.

Welcome Plan: In view of the heated public feeling against the phosphate producers, the move by the seven companies to get at basic issues has been commended by county and state observers.

One Florida newspaper, the Lakeland *Ledger*, noted: ". . . the industry is following through with its effort to foster good public relations in the county. Aware of the thoroughness and professional integrity of the research organization, the phosphate industry and Polk residents complaining about the fumes surely will be ready to accept with full confidence the findings resulting from the study."

LEGAL

Chlorine Antitrust Suit: Stanley Morian, president of Dixie Chemical Co. (Houston)—one of seven companies recently sued by the state of Texas for alleged antitrust violations in the sale of chlorine—has denied the price-fixing charges. He told *CW*, "We have never agreed with anyone on prices in the 12 years we have been in business. We don't let anyone influence us on our price."

The suit is the first antitrust action filed by Texas Attorney General Will Wilson since he announced in May that investigations were under way of possible collusive bidding. It was filed in state court in Austin against Dixie Chemical, Caska Chemical Co. (Houston), Schwartz Co. (El Paso), Schwartz, Inc. (Corpus Christi), Diamond Alkali (Cleveland), Frontier Chemical (Wichita, Kan.) and Thompson Hayward Chemical (Kansas City, Mo.).

The companies are accused of sub-

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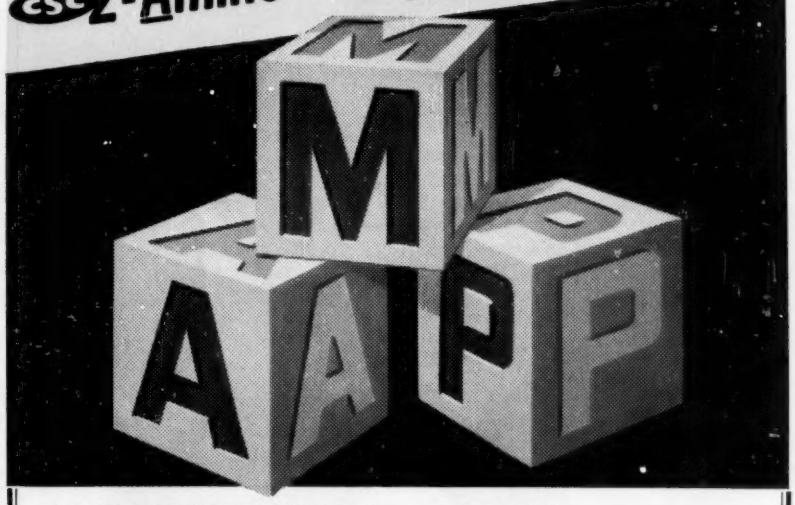

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mitting identical sealed bids to various Texas cities for the sale of liquid chlorine in 150-lb. cylinders. The state is asking for an injunction against "collusive, noncompetitive marketing practices" and for penalties of $50 to $1,500/day against each company since July 1, '55. The chlorine was used in the treatment of city water supplies.

J. D. Schwartz, part-owner of the El Paso firm, said he had some indication the charges might be made, added that the charges were unfounded, "as far as I know."

Wilson said he intends to continue investigating possible collusion in bidding on other products purchased by state and local government agencies.

•

Pollution Suit Ends: Index Chemical Co. (Green's Bayou, Tex.) has been found not guilty of charges that it was polluting the air. The Harris County health department last July claimed that the company's plant polluted the air with mercaptan. Justice of the Peace Walter Queen said the state did not present sufficient evidence in the case to prove that air pollution was caused by plant operations.

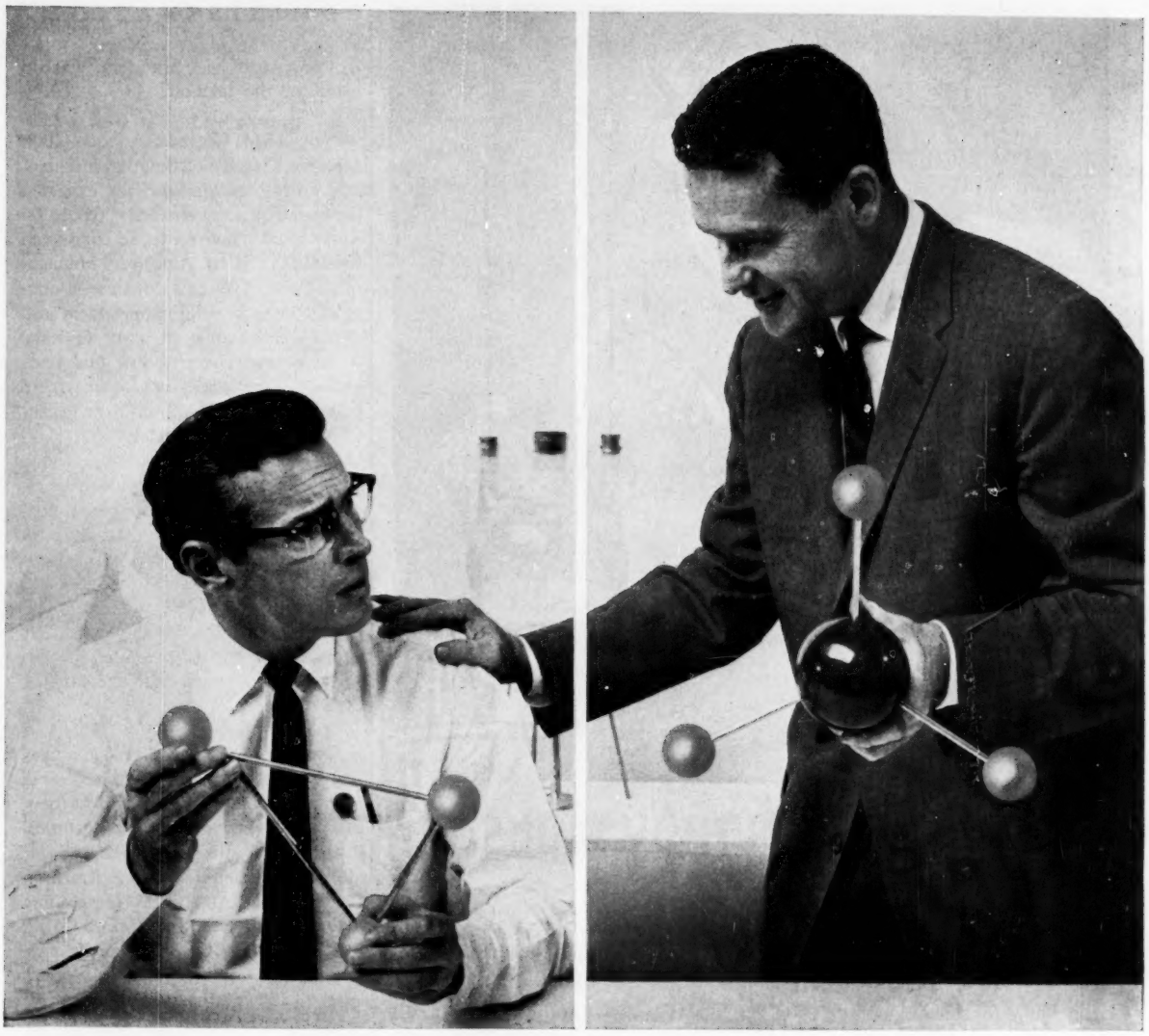
•

Beryllium Pollution Suit: A $1.5-million damage suit has been filed in U.S. district court at Wilmington, Del., against Beryllium Corp. (Reading, Pa.) The suit, filed by Julia and Julio Savini, of Temple, Pa., alleges that Beryllium "negligently" allowed beryllium to escape into the air, resulting in disabling injuries to Mrs. Savini.

The complaint asks $500,000 for injuries and cost of treatment, $500,000 damages for a hazard allegedly created by the company and another $500,000 for nuisance that the Savinis claim was caused by air pollution.

IDEAS

Air-Borne Public Relations: Ansul Chemical Co. (Marinette, Wis.) came in for a bit of unusual publicity recently by sponsoring a Cleveland woman in her first attempt to win the All Women's International Air Race. The flyer, Mrs. Elmer Wiedwald, flew a Cessna 172 to third place in the race from Welland, Ont., to Grand Bahama, B. W. I., averaging 128 mph. over the 1,313-mile route. L. C. Mc-



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Whatever your use for ammonia—refrigeration, metal treating, plastics, petroleum refining, textiles, paper manufacture, etc.—Texaco has the technicians and the facilities to help you use it more profitably.

Texaco's new facility at Lockport, Ill., offers other services, too. The ammonia produced is of high purity; it's delivered pure; and it's delivered to you right on schedule. There's a dependable supply, too, because Lockport's storage facilities are ample.

For fast, reliable ammonia service, call or write The Texas Company, *Petrochemical Sales Division,* 332 South Michigan Avenue, Chicago 4, Illinois, or 135 East 42nd Street, New York 17, N. Y.

TEXACO

PETROCHEMICALS

Cursed with lumpy caustic?

Eliminate this headache with Wyandotte *Flo-chilled** Anhydrous Caustic Soda. It's winning acclaim everywhere, because it's Flo-chilled to flow free and easy every season of the year . . . makes caking and lumping a thing of the past, even in damp, sweltering weather. Ask for a supply soon from your Wyandotte representative or distributor. Costs no more than ordinary caustic!

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Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION

WYANDOTTE CHEMICALS CORPORATION, WYANDOTTE, MICHIGAN

Offices in Principal Cities

PACING PROGRESS WITH CREATIVE CHEMISTRY

ADMINISTRATION

Kesson, Ansul vice-president, was on hand for the take-off.

•

New AMA Courses: About 60,000 executives, many of them from chemical process campanies, are expected to attend the new series of 1,000 educational meetings to be conducted until June '59 by American Management Assn. Two new courses—a one-week course in retail management and a two-week course in presupervisory training—are being offered this year, and 26 large-scale conferences are scheduled for '58-'59 in New York, Chicago and Los Angeles.

•

Boosters: To promote wider participation by businessmen in regional economic development on the state and local level, the Committee for Economic Development (New York) has published a 60-page pamphlet, "The 'Little' Economies." The pamphlet contains six papers presented by experts to the semiannual meeting of CED's board of trustees.

•

Executive Differences: What makes one executive "worth 10 times more than another"? The answer is "executive skill," according to a just-published book by Auren Uris, editor, Human Relations Division, Research Institute of America. "Developing Your Executive Skills" (McGraw-Hill, 262 pages, $4.50) is intended as a step-by-step guide to developing "every skill necessary for executive success."

LABOR

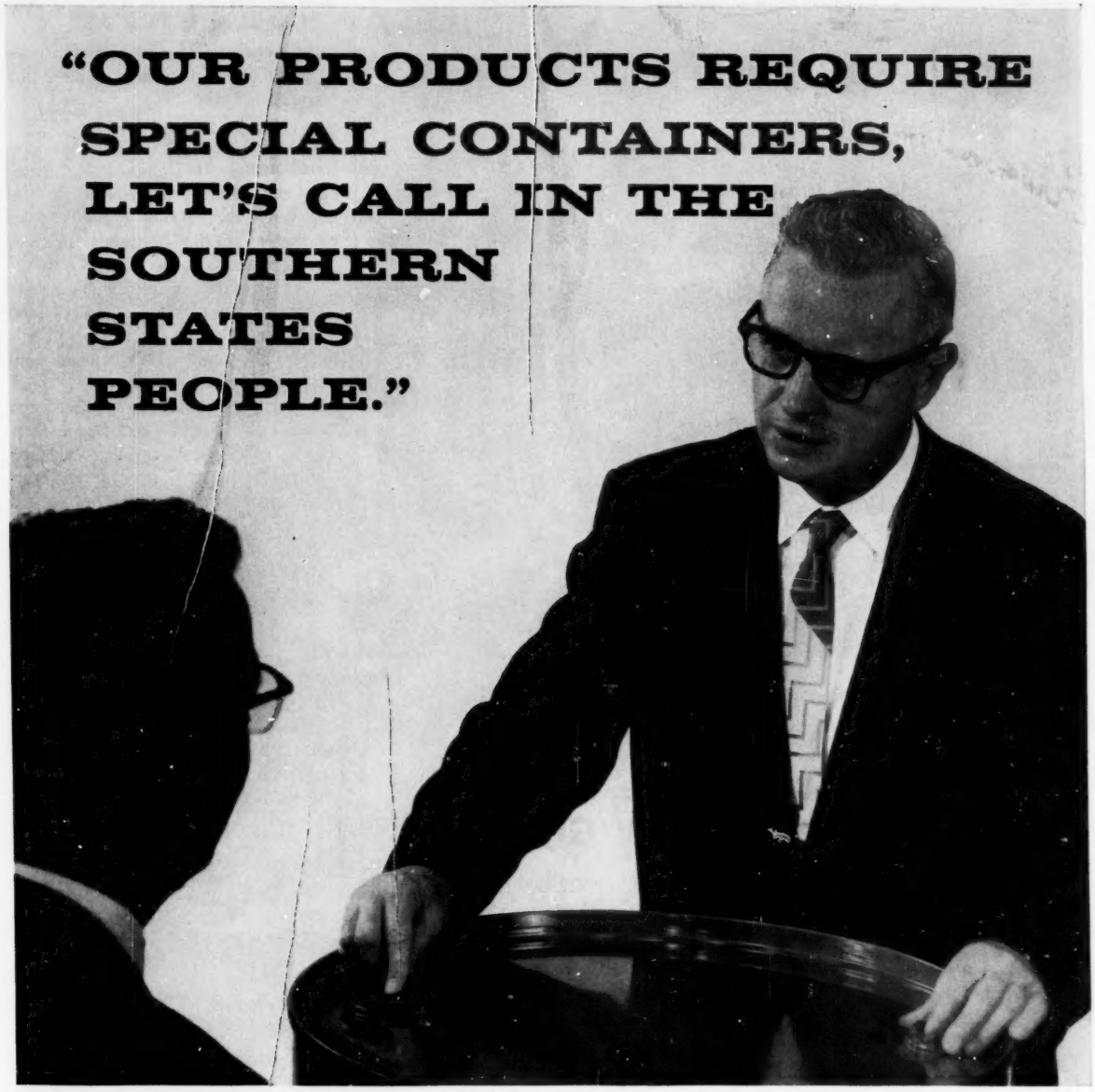
New Spencer Contract: Spencer Chemical Co. has signed a new contract with Local 644, International Chemical Workers, AFL-CIO, at the company's Henderson, Ky., plant.

The plant, which produces ammonia, nitrogen solutions for the fertilizer industry and nylon resin, had been operating without a contract since the previous agreement expired July 31.

The new contract calls for an additional 6¢/hour "across-the-board" wage increase. Expiration date is July 31, '59.

•

Heyden Newport Strike Ends: A 32-day strike at Heyden Newport's Garfield, N. J., plant has ended. The company's new two-year contract, retroactive to Aug. 1, with Oil, Chemical & Atomic Workers local calls for



Experience at Southern States has shown that it is best to treat every order as a special job requiring a special container. From our complete line of drums it is possible to package almost any product, develop the proper liner and closure, meet specifications of quality and delivery.

Companies large and small have repeatedly relied on Southern States to deliver metal containers that stand up equally well through both storage and shipping. Every drum is scientifically sealed to prevent leakage, all types of linings are applied to meet product requirements.

Forward-looking industries in the chemical, food and petroleum industries are relying on Southern States' men, facilities and drums for quality packaging. We will welcome the opportunity to give you the complete Southern States story. There is no obligation.

SOUTHERN STATES CONTAINERS

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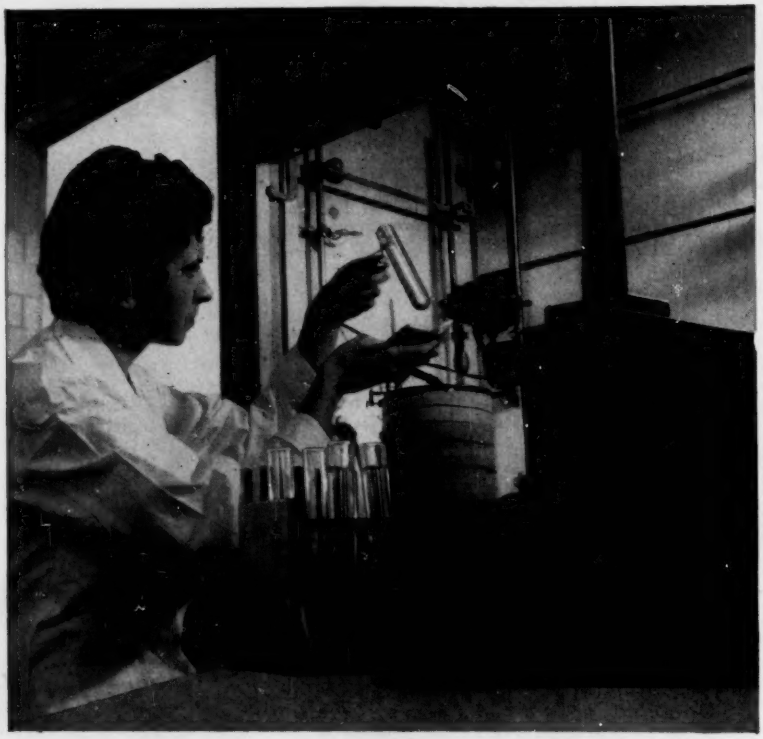
SINCE 1914 Birmingham, Alabama



GROCOL 600

by all tests, the best Hydrogenated Tallow Glyceride

Strict quality control in the manufacture of GROCOL 600 Hydrogenated Tallow Glyceride has established a new benchmark for the industry—an iodine value of below 0.5.

This indicates extremely low unsaturates and assures correspondingly long shelf life for your products—whether quality plasticizers, esters, lubricants or finishing agents for leather or textiles.

Lightness of color is unexcelled. Stability under heat is outstanding. In a recent test, production samples of GROCOL 600 gave a Lovibond reading of 0.2 red and 1.3 yellow before an A.O.C.S. method heat test, and a reading of 0.2 red and 2.2 yellow afterward.

Free fatty acid content is well under 0.5% with an average below 0.25%. Unsaponifiables are 0.25% maximum. Odor is bland.

Your payoff in sales will improve if you "Always specify A. Gross" Hydrogenated Tallow Glyceride—GROCOL 600. You can see why.

Send for samples and brochure, "Fatty Acids in Modern Industry."

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Stearic Acids • Red Oils • White Oleines
Tallow Fatty Acids • Coconut Fatty Acids • Vegetable Fatty Acids
Hydrogenated Fatty Acids • Hydrogenated Tallow Glycerides

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Distributors in principal cities • Manufacturers since 1837

ADMINISTRATION

"across-the-board" wage increases—7¢/hour the first year, 5¢/hour the second year.

•

Industrial Accident Hearing: National Aniline Division, Allied Chemical Corp., has been absolved of any negligence in the July 1 death of an employee at the division's Buffalo, N. Y., plant.

But Ben Blackwood, assistant state industrial commissioner, has reserved final determination as to the plant's responsibility and whether there were any violations.

As required by its new policy, the state's Labor Dept. conducted a fact-finding hearing into the death of Leo Gaik, 44, chemical operator and assistant foreman. Gaik fell through a roof well.

A company committee concluded that Gaik's weight caused the roofing to break.

KEY CHANGES

P. J. O'Brien to vice-president in charge of production and engineering and **R. F. Steel** to vice-president in charge of finance and administration, United States Borax & Chemical Corp.

J. Ross Tuttle to vice-president, International Division, Allied Chemical Corp. (New York).

William H. Schuette, to vice-president, Dow Chemical Co. (Midland, Mich.).

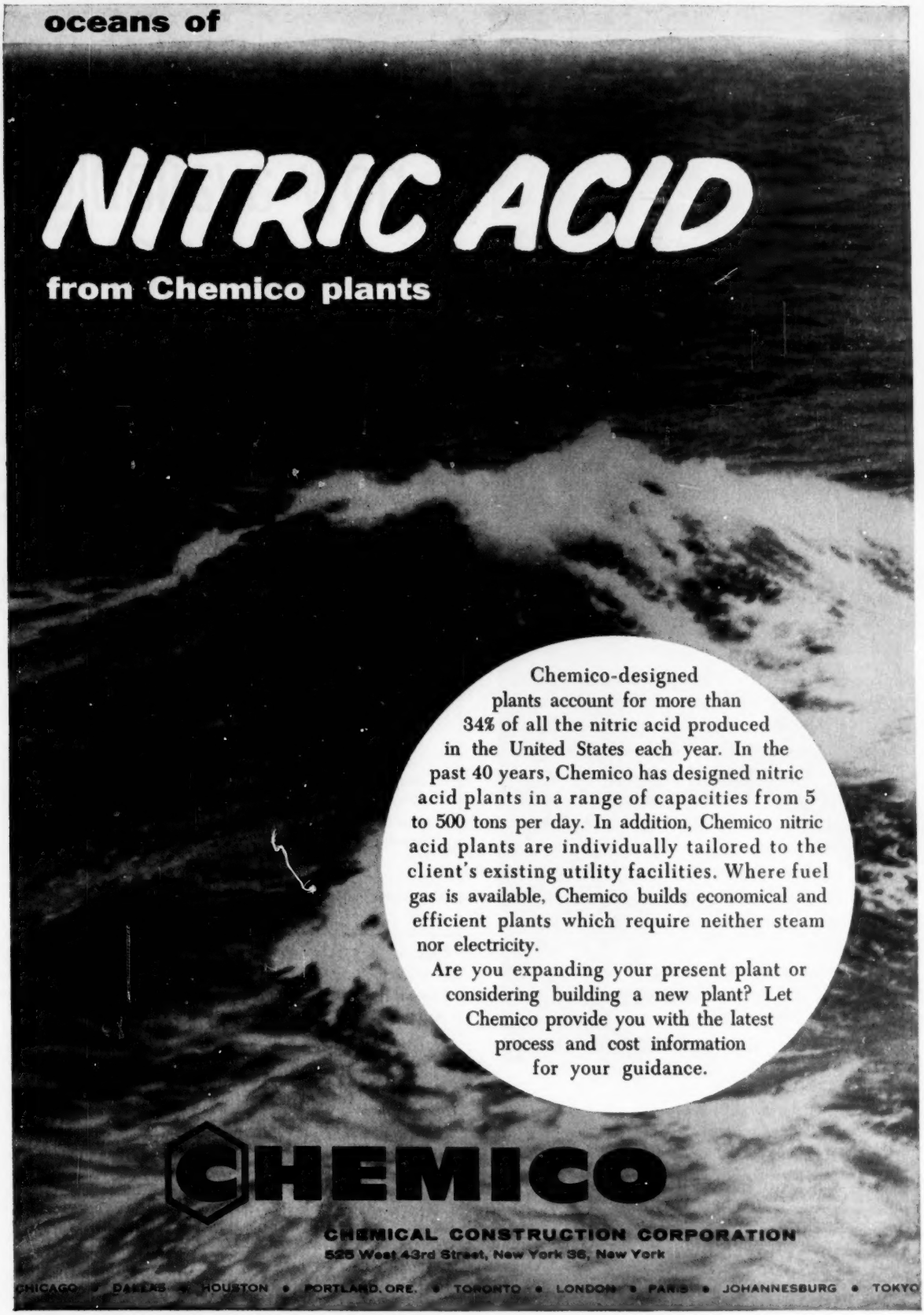
Roger T. Perkins to president, B. B. Chemical Co. (Cambridge, Mass.).

Val J. Millers to vice-president and general manager, Dixon International, a division of Dixon Chemical & Research and Dixon Chemical Industries (Bloomfield, N. J.).

M. F. Granville to general manager, Petrochemical Dept., The Texas Co.

Ira G. Needles to board chairman and **Robert V. Yohe** to president and chief executive officer, B. F. Goodrich Canada Ltd.; and **James C. Richards, Jr.,** to vice-president—sales, B. F. Goodrich Industrial Products Co., division; **J. Ward Keener** to chief executive officer, B. F. Goodrich (Akron, O.).

Hector C. Borghetty to general manager, foreign operations, General Aniline & Film Corp. (New York).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NITRIC ACID
from Chemico plants
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Are you expanding your present plant or considering building a new plant? Let Chemico provide you with the latest process and cost information for your guidance.
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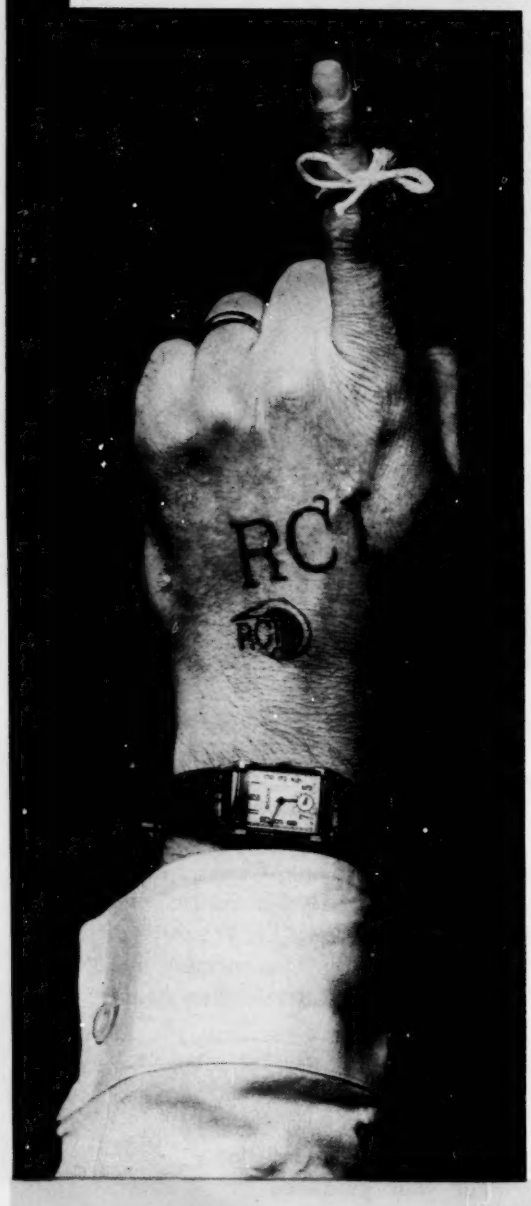
note: ORTHO-PHENYLPHENOL now available from RCI



● If you manufacture disinfectants for household, farm or industrial uses, you are familiar with the valuable properties of ortho-phenylphenol as a germicide and fungicide. It combines high efficiency against micro-organisms with low toxicity to higher forms of life. It has excellent stability and a very mild odor.

After a long program of research, development, pilot plant and product evaluation, Reichhold now offers ortho-phenylphenol for immediate shipment from inventory. This new RCI product is manufactured in the company's Tuscaloosa, Ala. plant and has already been enthusiastically accepted by selected customers to whom it has been offered.

Properties of RCI Ortho-phenylphenol

Appearance	white or grey to pink flakes
Molecular Weight	170.2
Freezing Point	57.2°C.
Boiling Point @ 760 m.m.	286°C.
Flash Point	255°F.
Solubilities (gm/100 gm solvent @ 25°C)	
Methyl Alcohol	950-1000
Ethyl Alcohol	550-600
Isopropyl Alcohol	550-600
Acetone	650-700
Olive Oil	50-100
Pine Oil	250-300
Water	less than 0.1

Specifications

Ortho-phenylphenol content	98.0% min.
Inerts	2.0% max.

Outside the field of micro-organism control, ortho-phenylphenol is now coming into its own as a dyeing assistant for synthetic fibers. Its chemical reactivity also offers interesting possibilities for its use as an intermediate. Write today for additional information.

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Formaldehyde • Glycerine • Phthalic Anhydride • Maleic Anhydride • Sebacic Acid
Sodium Sulfite • Pentaerythritol • Pentachlorophenol • Sulfuric Acid

REICHHOLD CHEMICALS, INC., RCI BUILDING, WHITE PLAINS, N. Y.

New Units Bolster Sulfuric Plant Rundown

Producer	*Location*	*Type Plant*
Alabama (Capacity: 578,000 tons)		
Amer. Agr. Chem. Co.	Montgomery	Chamber
American Cyanamid Co.	Mobile	Contact
Du Pont	Mineral Springs	Contact
Home Guano Co.	Dothan	Chamber
Virginia-Carolina Chem. Co.	Birmingham	Contact
Virginia-Carolina Chem. Co.	Wylan Station	Chamber
Virginia-Carolina Chem. Co.	Mobile	Chamber
Virginia-Carolina Chem. Co.	Dothan	Chamber
Tennessee Corp.	Childersburg	Contact
Standard Chem. Co.	Troy	Chamber
Consolidated Chem.	Le Moyne	Contact
Reichhold	Tuscaloosa	Contact
Arizona (Capacity: 300,000 tons)		
Apache Powder Co.	Benson	Contact
Inspiration Consolidated Mining Co. (Anaconda Copper Co.)	Miami	Contact
Kennecott Copper	Hayden	Contact
Southwestern Agr. Chem. Co.	Chandler	Contact
Arkansas (Capacity: 216,000 tons)		
Olin Mathieson Chem. Corp.	Little Rock	Contact
Lion Oil Co. (Monsanto)	El Dorado	Contact
California (Capacity: 935,000 tons)		
American Smelting & Refining	Selby	Contact
General Chemical	El Segundo	Contact
General Chemical	Bay Point	Contact
General Chemical	Richmond	Contact
Monsanto	Avon	Contact
Stauffer Chem. Co.	Domingue	Contact
Stauffer Chem. Co.	Stege	Contact
Stauffer Chem. Co.	Vernon	Contact
Best Fertilizer Co.	Lathrop	Contact
Colorado (Capacity: 212,000 tons)		
General Chemical	Denver	Contact
Rico Argentine	Rico	Contact
Connecticut (Capacity: 50,000 tons)		
U.S. Rubber Co.	Naugatuck	Chamber
Delaware (Capacity: 125,000 tons)		
General Chemical	North Claymont	Contact
Florida (Capacity: 2,000,000 tons)		
Amer. Agr. Chem. Co.	Pensacola	Chamber
Amer. Agr. Chem. Co.	Pierce	Chamber

Sulfuric acid producers, undismayed by slack demand in the first three quarters, look for better times the rest of this year. Current increased activity by the steel industry, signs of a good year for fertilizer makers, growing demands by uranium mills indicate that, over-all, sulfuric will not make as poor a showing in '58 as was predicted a few months back.

Here are some of the high spots of optimistic industry activity:

- General Chemical's new plants at Elizabeth, N. J., and Anacortes, Wash., both came onstream the first half of this year.
- Olin Mathieson is upping capacity to 500 tons/day at its Beaumont, Tex., plant.
- Minnesota will be added to the list of sulfuric acid producing states when North Central Chemical's proposed installation at Hastings comes onstream.
- Fremont Minerals will construct a sulfuric acid plant at Riverton, Wyo., for the new uranium mill to be built there shortly.
- Du Pont has purchased the idle sulfuric acid plant at Cornwells Heights, Pa., has modernization plans already in work.

Extent of the activity is reflected in *CW's* complete state-by-state listing of U.S. sulfuric acid plants and total capacities (*pp. 41-50*).

Despite the sluggishness that plagued the chemical industry during the first three quarters of this year, market followers estimate that by year's end U.S. acid users will have consumed 16.7 million tons. This is 500,000 tons under '56's record take of 17.2 million tons, some 300,000 tons less than last year's demands.

Uranium Demand Spurt: Main factor that has encouraged sulfuric acid producers is the growing demand by the nonferrous metals industry—notably uranium milling, which this year has taken some 725,000 tons of sulfuric. It used 625,000 tons in '57. Improved milling processes using the acid have increased uranium recovery from ore.

Main sulfuric acid customer is still the fertilizer industry. Despite the slow start in fertilizer usage in the early

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Producer	*Location*	*Type Plant*
Armour Fertilizer Works	Bartow	Contact
Armour Fertilizer Works	Jacksonville	Chamber
Virginia-Carolina Chem. Co.	Nichols, 2 plants	Contact
Davison Chem. Co. (W. R. Grace)	Ridgewood	Contact
Swift & Co.	Bartow	Contact
Tennessee Corp.	Tampa	Contact
Wilson & Toomer Fertilizer Co.	Jacksonville	Chamber
Wilson & Toomer Fertilizer Co.	Cottondale	Chamber
Int. Minerals & Chem. Corp.	Mulberry	Contact
Royster Guano Co.	Pierce	Contact
American Cyanamid Co.	Brewster	Contact
Georgia (Capacity: 425,000 tons)		
Amer. Agr. Chem. Co.	Savannah	Chamber
Armour Fertilizer Works	Albany	Chamber
Armour Fertilizer Works	Atlanta	Chamber
Armour Fertilizer Works	Columbus	Chamber
Cotton States Fertilizer Works	Macon	Chamber
Royster Guano Co.	Athens	Chamber
Royster Guano Co.	Macon	Chamber
Georgia Fertilizer Co.	Valdosta	Chamber
Pelham Phosphate Co.	Pelham	Chamber
Southern Fertilizer & Chem.	Savannah	Contact
Southern States Phosphate & Fertilizer Co.	Savannah	Chamber
Virginia-Carolina Chem. Co.	Augusta	Chamber
Virginia-Carolina Chem. Co.	Rome	Chamber
Virginia-Carolina Chem. Co.	Savannah	Chamber
Smith Guano Co.	Moultrie	Chamber
American Cyanamid	Savannah	Contact
Idaho (Capacity: 120,000 tons)		
Sullivan Mining Co.	Kellogg	Contact
Illinois (Capacity: 2,000,000 tons)		
Amer. Agr. Chem. Co.	E. St. Louis	Chamber
Amer. Agr. Chem. Co.	Fulton	Chamber
American Cyanamid Co.	Joliet	Contact
American Zinc Co. of Ill.	E. St. Louis	Contact, Chamber
Armour Fertilizer Works	Chicago Heights	Chamber
Olin Mathieson Chem. Corp.	Joliet	Contact
General Chemical	E. St. Louis	Contact
General Chemical	Hegewisch	Contact
Monsanto Chemical Co.	E. St. Louis	Contact
Matthiessen & Hegeler Zinc Co.	La Salle	Chamber
Nat. Distillers Co. (U.S.I. Chem. Div.)	Tuscola	Contact
Kankakee Ordnance*	Joliet	Contact
Swift & Co.	Chicago Heights	Contact
Smith-Douglass Co.	Streator	Contact
C. K. Williams & Co.	E. St. Louis	Chamber
Indiana (Capacity: 600,000 tons)		
Du Pont	E. Chicago	Contact
Standard Oil of Indiana	Whiting	Contact

* Not Operating

part of the agricultural season, total demand for the acid in the production of phosphatic plant nutrients and synthetic and coke-oven ammonium sulfate is expected to be 5.6 million tons, 33% of total sulfuric needs.

Some 4.3 million tons of acid is slated for use in the manufacture of phosphatic fertilizers. This is just about what the industry used last year. On the other hand, demand for sulfuric by ammonium sulfate makers this year is expected to register a severe drop, to 1.3 million tons, compared with some 1.49 million tons last year. Reasons: lagging output of steel and, in turn, by-product ammonium sulfate.

Last year, makers of coke-oven steel produced 45% of the 1.98-million-tons output of ammonium sulfate. This year, they expect to make 35% of the 1.7 million tons of sulfate likely to be produced.

Up, Down Pattern: Petroleum processors rank next in the line-up of important purchasers of sulfuric. This year, the industry is expected to siphon off some 1.3 million tons. It used 1.27 million tons in '57.

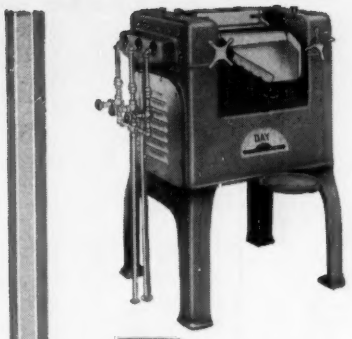
Use of sulfuric in rayon production has suffered, as demand for the fiber continues to be crippled by the encroachment of the noncellulosics, notably nylon for tire cord.

Demand for the acid in aluminum sulfate production is also expected to show a slight setback this year. Reason: general inactivity of the pulp and paper industry, which consumes nearly two-thirds of available alum in water treatment.

However, booming markets for hydrofluoric acid and synthetic detergents, big users of sulfuric, has helped compensate for these declines. Output of both are expected to hit records this year: some 87,000 tons of hydrofluoric acid; about 3 million lbs. of synthetic detergents.

Iron, Steel Demand Dives: Demand for sulfuric acid in iron and steel pickling is expected to nose-dive 20%, to about 800,000 tons this year, again because of dawdling steel output earlier in the year. With a spurt in steel demand now apparent, acid makers see some reason for cheer.

Over-all, the picture shapes up like this: once the chemical and allied industries get back to full-scale production, demand for sulfuric should again resume its upward trend.



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Features include:
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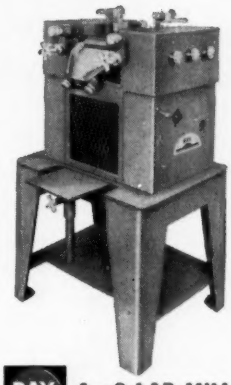
- Feed hoppers
- Day Hydra-Set as optional equipment

increase your profits three ways



DAY 4 x 8 LAB MILL
saves time because you get the answers quickly and accurately.
Features include:
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- Quick release hand-wheel adjustments
- Floor or bench model

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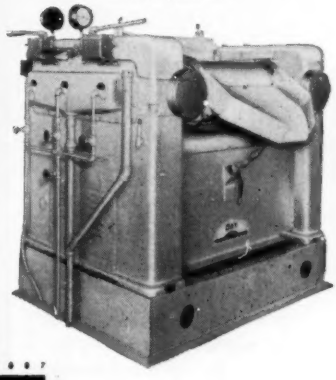
saves time and money by virtually eliminating "downtime", because of precision engineered, rugged construction.
- Available in 10 x 22 and 14 x 30 sizes
- All standard production mills are readily converted to either fixed or floating roll operation
- Day Hydra-Set available as optional equipment



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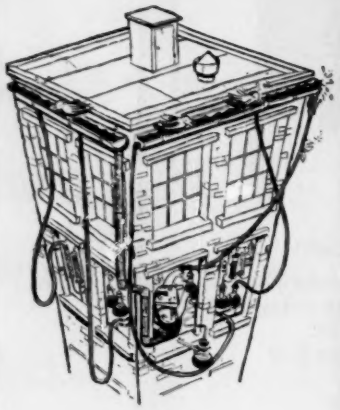
Producer	Location	Type Plant
Stauffer Chem. Co.	Hammond	Contact
Rauh & Sons Fert. Co.	Indianapolis	Contact
Iowa (Capacity: 126,000 tons)		
National Distillers	Dubuque	Contact
Int. Minerals & Chem. Corp.	Mason City	Contact
Amer. Agr. Chem. Co.	Clinton	Chamber
Kansas (Capacity: 155,000 tons)		
National Distillers	DeSoto	Contact
Eagle-Picher	Galena	Contact
Kentucky (Capacity: 95,000 tons)		
Du Pont	Wurtland	Contact
Pennsalt	Calvert City	Contact
Louisiana (Capacity:900,000 tons)		
Armour Fertilizer Co.	New Orleans	Chamber
Cities Service Co.	Lake Charles	Contact
American Cyanamid Co.	Avondale	Contact
Consolidated Chem. Ind. (Stauffer)	Baton Rouge	Contact
Olin Mathieson Chem. Corp.	Bossier City	Contact
Swift & Co.	Harvey	Chamber
Virginia-Carolina Chem. Co.	Shreveport	Chamber
General Chemical	Baton Rouge	Contact
Maine (Capacity: 44,000 tons)		
Summers Fertilizer Co.	Searsport	Contact
Maryland (Capacity: 1,400,000 tons)		
Amer. Agr. Chem. Co.	Baltimore	Chamber
Baugh Chem. Co.	Baltimore	Chamber
Davison Chem. Co. (W. R. Grace)	Baltimore	Chamber, Contact
Royster Guano Co.	Baltimore	Chamber
Olin Mathieson Chem. Corp.	Baltimore	Chamber, Contact
Bethlehem Steel Co.	Sparrows Pt.	Contact
Naval Powder Co.*	Indian Head	Chamber
Massachusetts (Capacity: 125,000 tons)		
Amer. Agr. Chem. Co.	N. Weymouth	Chamber
Monsanto Chem. Co.	Everett	Contact
Michigan (Capacity: 400,000 tons)		
Amer. Agr. Chem. Co.	Detroit	Chamber
Amer. Agr. Chem. Co.	Bay City	Contact
American Cyanamid Co.	Kalamazoo	Contact
Detroit Chem. Works	Detroit	Contact
Du Pont	Ecorse	Contact
General Chemical	River Rouge	Contact
Minnesota (Capacity†: 85,000 tons)		
North Central Chemical Inc.†	Hastings	Contact

* Not Operating; † Proposed.



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When you need a special organic in a quantity that strains your laboratory facilities or ties up your staff, try Eastman Organic Chemicals Department, *Distillation Products Industries*, Rochester 3, N. Y.

there are some 3700 Eastman Organic Chemicals for science and industry

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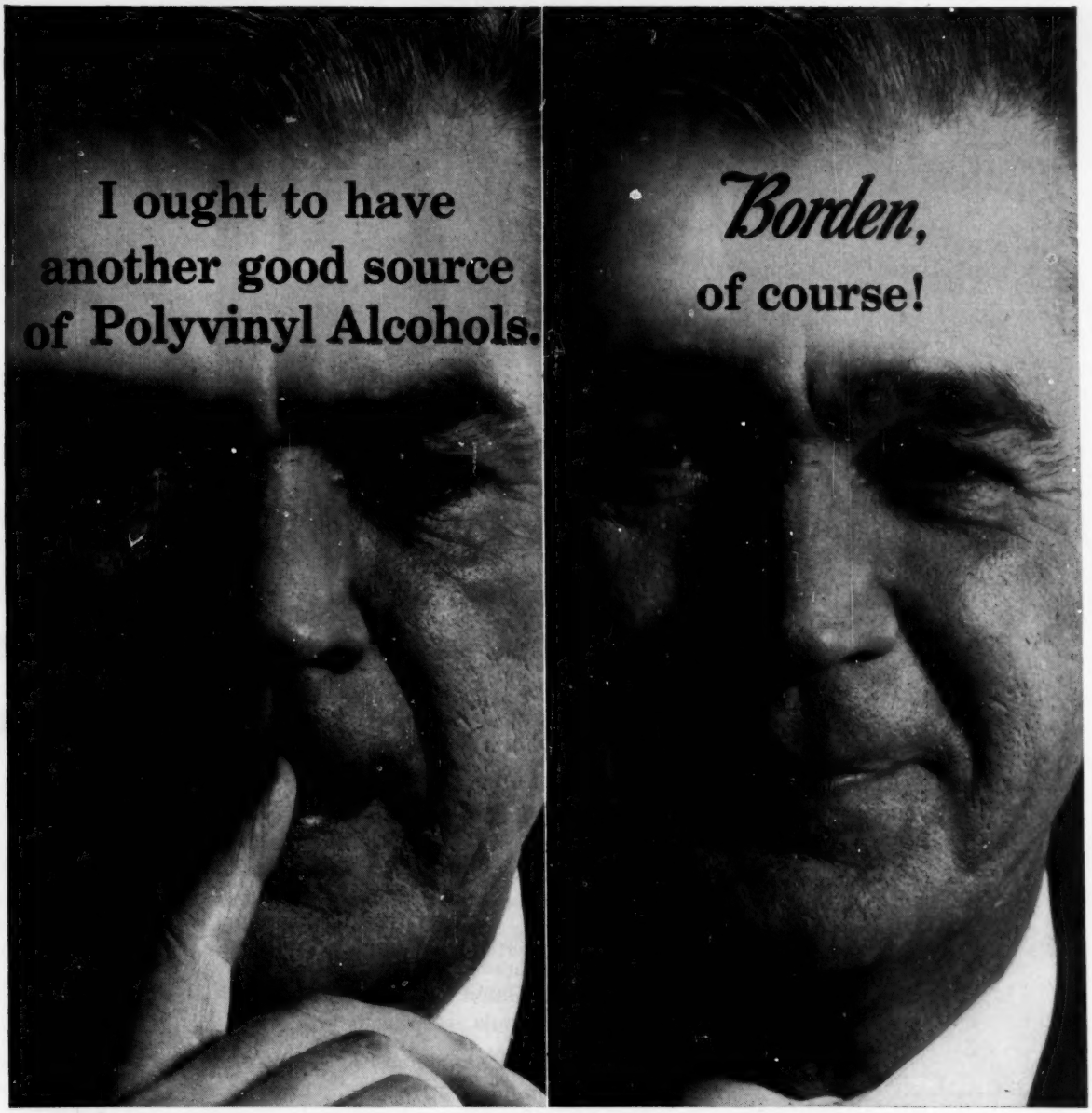

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Newest is a LEMOL modification *developed in the Borden Research and Development Laboratories.* It's called LEMOFLEX. And the big news is its application in the field of water-soluble packages for powdered detergents, bleaches and sanitary chemicals. LEMOFLEX is an *internally-plasticized* polyvinyl alcohol powder that's completely soluble in water at room temperature.

Polyvinyl alcohols? Borden, of course. And that goes for acrylic, butadiene-styrene, vinyl chloride, polystyrene, butadiene acrylonitrile and polyvinyl acetate emulsions as well. In other words, *all* your polymer requirements can be satisfied at Borden. *And we mean satisfied.* Let us prove it! Write today to The Borden Chemical Company, Polyco-Monomer Department CW3-98, 350 Madison Ave., New York 17, New York.

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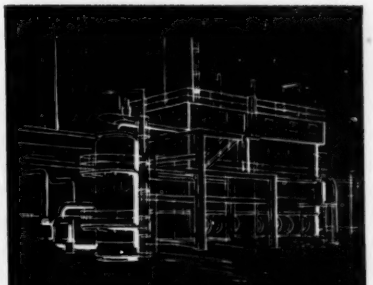
P. O. Box 9716, Houston 15, Texas

Producer	Location	Type Plant
Mississippi (Capacity: 110,000 tons)		
Int. Minerals & Chem. Corp.	Tupelo	Chamber
Coastal Chem. Corp.	Pascagoula	Contact
Missouri (Capacity: 490,000 tons)		
National Lead Co.	St. Louis	Contact
Thurston Chem. Div. (W. R. Grace)	Joplin	Contact
Montana (Capacity: 86,000 tons		
Anaconda Copper Mining Co.	Anaconda	Chamber, Contact
Nebraska, New Hampshire, North Dakota—No plants		
Nevada (Capacity: 169,000 tons)		
Anaconda Copper Mining Co.	Yerington	Contact
New Jersey (Capacity: 1,950,000 tons)		
Amer. Agr. Chem. Co.	Carteret	Chamber
American Cyanamid Co.	Bound Brook	Contact
American Cyanamid Co.	Warners	Contact
Armour Fertilizer Works	Carteret	Chamber
Du Pont	Deepwater	Contact
Du Pont	Grasselli	Contact
Du Pont	Gibbstown	Contact
Koppers Coke Co.	Kearney	Contact
National Lead Co.	Sayerville	Contact
Dixon Chem. & Research	Paulsboro	Contact
Dixon Chem. & Research	Newark	Contact
General Chemical	Elizabeth	Contact
New Mexico (Capacity: 85,000 tons)		
Anaconda Copper Mining Co.	Grants	Contact
New York (Capacity: 227,000 tons)		
Amer. Agr. Chem. Co.	Buffalo	Chamber
Eastman Kodak	Rochester	Contact
General Chemical	Buffalo	Contact
North Carolina (Capacity: 192,000 tons)		
Acme Fertilizer Co.	Acme	Chamber
Armour Fertilizer Works	Greensboro	Chamber
Armour Fertilizer Works	Navassa	Chamber
Swift & Co.	Wilmington	Chamber
Virginia-Carolina Chem. Co.	Durham	Chamber
Virginia-Carolina Chem. Co.	Selma	Chamber
Virginia-Carolina Chem. Co.	Navassa	Contact
Amer. Agr. Chem. Co.	Greensboro	Chamber
Ohio (Capacity: 1,034,000 tons)		
Amer. Agr. Chem. Co.	Cleveland	Chamber
Amer. Agr. Chem. Co.	St. Bernard	Chamber
Armour Fertilizer Works	Sandusky	Chamber
Diamond Fertilizer Co.	Sandusky	Contact



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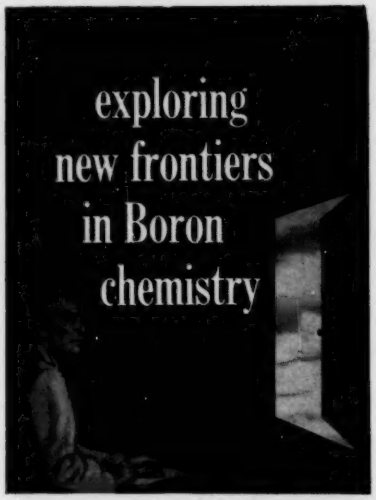

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Both compounds have been suggested as polymerization catalysts. BCl_3 has been proposed as a Friedel-Crafts condensing agent for organic synthesis, as a catalyst in inorganic reactions, and is particularly effective for the control of magnesium metal fires. It has been patented for stabilization of sulfur trioxide.

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MARKET DEVELOPMENT DEPARTMENT

TRONA

American Potash & Chemical Corporation

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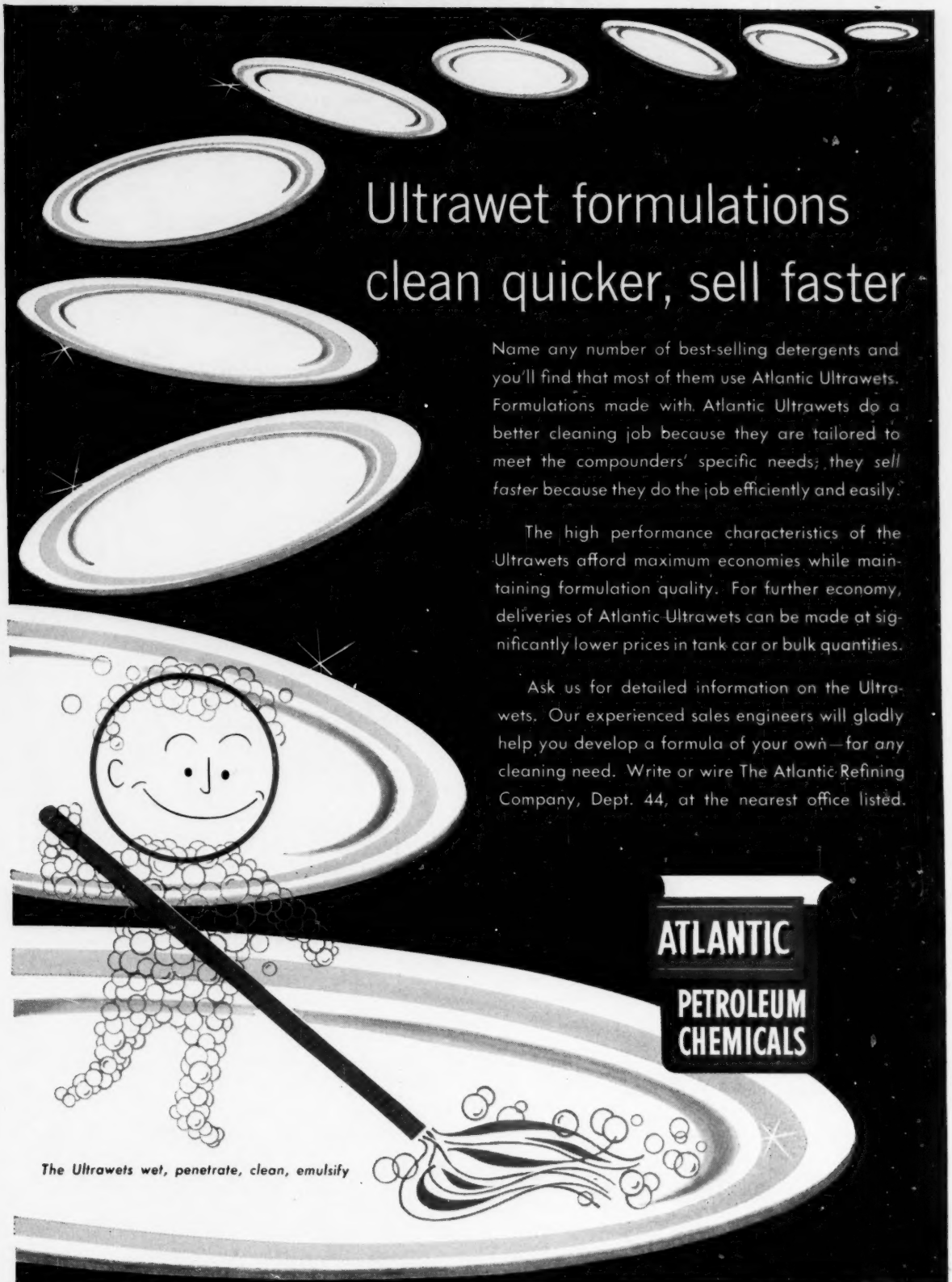
Producer	*Location*	*Type Plant*
Du Pont	Cleveland	Contact
Du Pont	North Bend	Contact
Du Pont	Toledo	Contact
Farmers Fertilizer Co.	Columbus	Chamber
General Chemical	Cleveland	Contact
General Chemical	Painesville	Contact
Minnesota Mining & Mfg. Co.	Copley	Contact
Royster Guano Co.	Toledo	Contact
Smith Agr. Chem. Co.	Columbus	Chamber
Virginia-Carolina Chem. Co.	Cincinnati	Contact
Int. Minerals & Chem. Corp.	Lockland	Contact
American Cyanamid Co.	Hamilton	Contact
Oklahoma (Capacity: 230,000 tons)		
National Zinc Co.	Bartlesville	Contact
Ozark-Mahoning Co.	W. Tulsa	Contact
Oregon—No plants		
Pennsylvania (Capacity: 1,000,000 tons)		
U.S. Steel	Donora	Chamber
Atlantic Refining Co.	Philadelphia	Contact
L. Sonneborn Sons Inc.	Petrolia	Contact
New Castle Chem. Co.	New Castle	Chamber
General Chemical	Newell	Contact
Rohm & Haas Co.	Philadelphia	Contact
N.J. Zinc Co. of Pa.	Palmerton	Contact
Du Pont	Cornwells Hts.	Contact
Pittsburgh Coke & Chemical	Neville Island	Contact
St. Joseph Lead Co.	Josephstown	Contact
C. K. Williams & Co.	Easton	Contact
Rhode Island (Capacity: 20,000 tons)		
Heyden Newport Chem.	Rumford	Contact
South Carolina (Capacity: 230,000 tons)		
Amer. Agr. Chem. Co.	Charleston	Chamber
Amer. Agr. Chem. Co.	Columbia	Chamber
Anderson Fertilizer Co.	Anderson	Chamber
W. R. Grace	Charleston	Contact
Planters Fertilizer & Phosphates	Charleston	Chamber
Royster Guano Co.	Charleston	Chamber
Virginia-Carolina Chem. Co.	Charleston	Chamber
Virginia-Carolina Chem. Co.	Greenville	Chamber
Int. Minerals & Chem. Corp.	Spartanburg	Chamber
South Dakota—No plants		
Tennessee (Capacity: 1,125,000 tons)		
Armour Fertilizer Works	Nashville	Chamber
Tennessee Corp.	Copperhill	Contact
Virginia-Carolina Chem. Co	Memphis	Chamber
Volunteer Ordnance*	Tyner	Contact

* Not Operating



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The high performance characteristics of the Ultrawets afford maximum economies while maintaining formulation quality. For further economy, deliveries of Atlantic Ultrawets can be made at significantly lower prices in tank car or bulk quantities.

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We would like to discuss with you the possibilities of Tennessee's Liquid Sulfur Dioxide in your processing.

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Producer	*Location*	*Type Plant*
Texas (Capacity: 1,730,000 tons)		
American Smelting & Refining	Corpus Christi	Contact
Armour Fertilizer Works	Houston	Chamber
Union Carbide	Texas City	Contact
Consolidated Chem. Ind. (Stauffer)	Fort Worth	Contact
Consolidated Chem. Ind. (Stauffer)	Houston	Contact
Consolidated Chem. Ind. (Stauffer)	Baytown	Contact
Gulf Oil Corp.	Port Arthur	Contact
Texas City Chem. Co. (Smith-Douglass)	Texas City	Contact
Olin Mathieson Chem. Corp.	Beaumont	Contact
Olin Mathieson Chem. Corp.	Port Arthur	Contact
Olin Mathieson Chem. Corp.	Pasadena	Contact
Shamrock Oil & Gas	Sunray	Contact
Utah (Capacity: 185,000 tons)		
Garfield Chem. Mfg. Co.	Garfield	Contact
Texas Zinc Mineral Co.	Mexican Hat	Contact
Vermont—No plants		
Virginia (Capacity: 643,000 tons)		
Amer. Agr. Chem. Co.	Alexandria	Chamber
American Cyanamid Co.	Piney River	Contact
General Chemical	Pulaski	Contact
General Chemical	Front Royal	Contact
Radford Ordnance (Hercules)*	Pepper	Contact
Robertson Chem. Corp.	Norfolk	Chamber
Royster Guano Co.	Norfolk	Chamber
Smith-Douglass Co.	Norfolk	Contact
Virginia-Carolina Chem. Co.	Lynchburg	Chamber
Virginia-Carolina Chem. Co.	Pinners Point	Chamber
Virginia-Carolina Chem. Co.	Richmond	Chamber
Du Pont	James River	Contact
Swift & Co.	Norfolk	Contact
Weaver Fertilizer Co.	Norfolk	Contact
Washington (Capacity: 200,000 tons)		
American Smelting & Refining Co.	Tacoma	Contact
General Chemical	Anacortes	Contact
West Virginia (Capacity: 158,000 tons)		
Union Carbide	S. Charleston	Contact
General Chemical	Nitro	Contact
Wisconsin (Capacity: 129,000 tons)		
Du Pont	Barksdale	Contact
Badger Ordnance*	Baraboo	Contact
Royster Guano Co.	Madison	Contact
Wyoming (Capacity: 70,000 tons)		
Standard Oil of Ind.	Casper	Contact

* Not Operating

Progress Report...

—CARBOWAX polyglycols
—Hot-spray coatings
—Ethanolamines

An ancient medication gets modern improvements

For more than a hundred years, therapeutic suppositories have been formulated with cocoa butter. Recently, however, CARBIDE's CARBOWAX polyethylene glycols have been tested for this purpose and found to have numerous advantages over the traditional type of base.

CARBOWAX polyethylene glycols are compatible with a large number of drugs administered in suppository form. Formulations with various rates of disintegration are possible with CARBOWAX polyethylene glycols. A wide range of melting points and solubilities is possible by varying the ratio of low to high molecular weight polyethylene glycols in the formula.

Other advantages of CARBOWAX polyethylene glycol bases, of special interest to the compounder, are their relatively short congealing time, their ease of removal from the mold, their compatibility with substances often difficult to formulate, and their ability to give the suppository a good appearance.

The table below lists melting points and solubilities of certain CARBOWAX polyethylene glycol compounds.

Hexanetriol-1,2,6, a relatively new chemical, is an excellent plasticizing agent for CARBOWAX compounds. A detailed report on CARBOWAX polyethylene glycol suppository bases was published in the March, 1957 "American Professional Pharmacist." Reprints of this comprehensive article are available. Please check the coupon for a copy.

Hot-spray lacquer coatings

An increasingly popular method of spray coating is the use of hot-spray lacquers. Since heat, rather than additional solvents, is used to thin the lacquer, the solvent system becomes critical in the formulation.

Fewer coats of hot-spray lacquers are needed because of the higher solids content. Hot-spraying also improves flowout . . . minimizes blushing . . . and increases the resistance of the finish to checking and peeling.

Experience has proved that medium and high boiling point solvents offer the best performance in hot-spray application. CELLOSOLVE solvent, CELLOSOLVE acetate, and butyl CELLOSOLVE fill the bill. *And,* by selectively blending these solvents with CARBIDE's methyl isobutyl ketone or n-butyl acetate, you can vary the drying time to fit your production schedule.

For help in choosing the proper solvents, send for the handy 6-page "Solvent Selector" which gives complete, unbiased data on 70 compounds. Just check the coupon.

Ethanolamines "down on the farm"

CARBIDE's alkanolamines and their derivatives have many useful applications in agricultural chemicals for farmers all over America.

Diethanolamine, triethanolamine, and mixed isopropanolamine are efficient solubilizers for 2,4-D and similar herbicides. Agricultural sprays are composed of (phenylmercury) triethanolammonium lactate and (phenylmercury) monoethanolammonium acetate. Diethanolamides are useful as emulsifiers in various agricultural insecticidal concentrates. For more information check the coupon.

Tear out this coupon. Check the boxes on which you'd like more information, and mail to Dept. H, Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

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And remember, there is a CARBIDE sales office near you where you can obtain the services of a CARBIDE Technical Representative. His wide industry experience is backed both by extensive chemical training and by Technical Specialists.

"Carbowax," "Cellosolve" and "Union Carbide" are trade-marks of Union Carbide Corporation.

SOLUBILITIES AND MELTING POINTS OF "CARBOWAX" POLYETHYLENE GLYCOL COMPOUNDS

AVERAGE MOL. WT.	200	300	400	600	1000	1500	1540	4000	6000
MELTING POINT °C.	−15	−15 to −8	4 to 8	20 to 25	37 to 40	38 to 41	43 to 46	53 to 56	60 to 63
SOLUBILITY IN WATER	100%	100%	100%	100%	70%	73%	70%	62%	50%

Hexanetriol-1,2,6: Melting Point −20°C., 100% water soluble.

UNION CARBIDE CHEMICALS COMPANY
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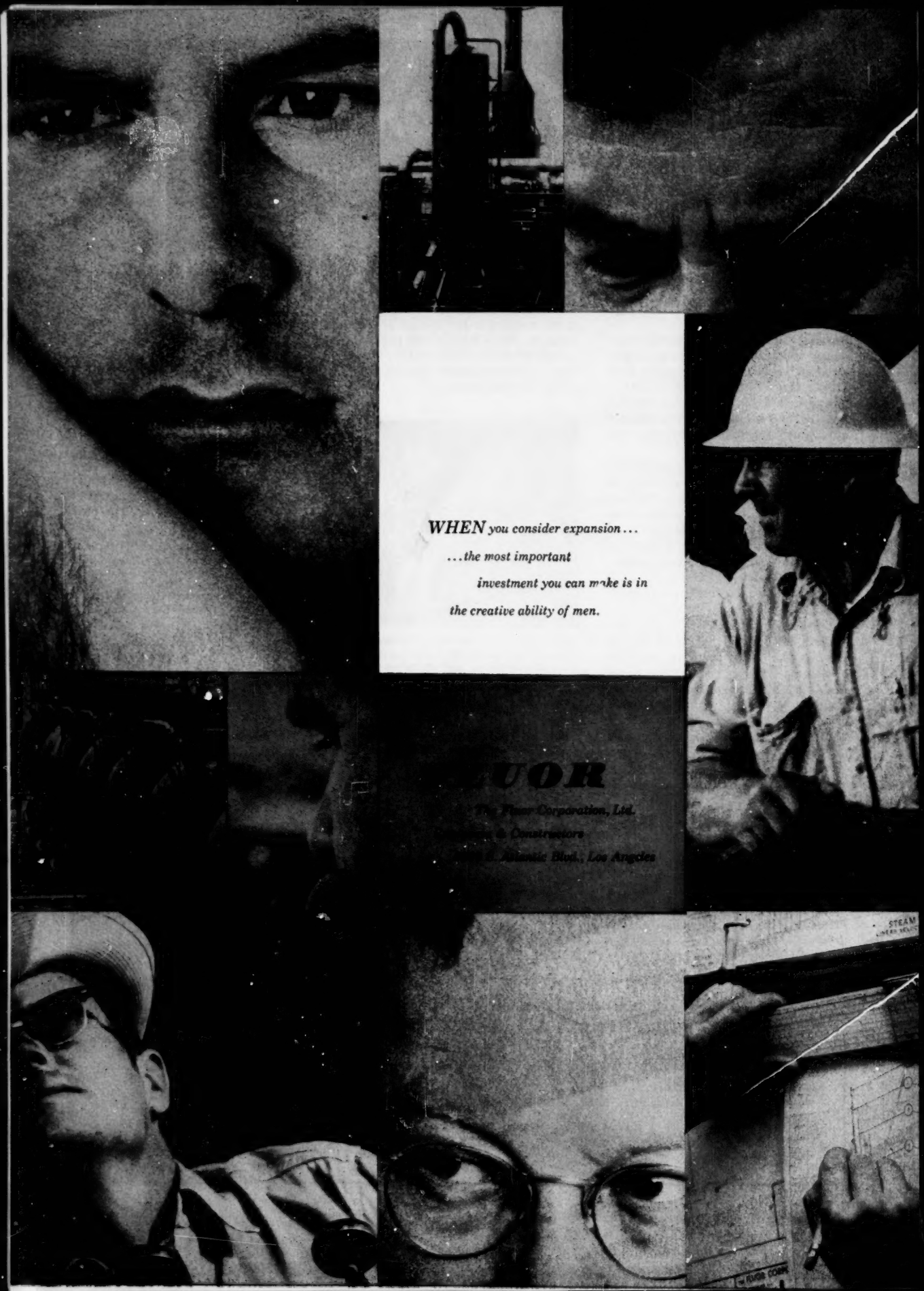
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investment you can make is in
the creative ability of men.
STEAM

NEW ACRYLONITRILE PROCESS IS CLAIMED TO:

- *cut investment costs 10%*
- *cut raw material costs 9%*
- *raise yield 11%*
- *cut finished acrylonitrile cost 14%*
- *improve purity, safety*
- *make location more flexible*

Acrylonitrile Cost Shortcuts

Claiming a raft of advantages for its process — cheaper, more easily handled starting material, higher yields, higher product purity, lower plant installation cost — The Uhde Corp. (New York) is now offering a novel acrylonitrile-from-acetaldehyde process to U.S. companies (CW Technology Newsletter, Aug. 16, p. 56).

The German-developed process has been proved out in a 30-tons/month unit of Knapsack-Griesheim (like Uhde, a Farbwerke Hoechst subsidiary). Key: a brand-new method of stabilizing and dehydrating lactonitrile — the tricky intermediate produced by the reaction of acetaldehyde with hydrogen cyanide. The more direct route used by all but one U.S. producer (acetylene plus hydrogen cyanide) has a number of limitations. And the ethylene oxide-and-hydrogen cyanide route used by Union Carbide Corp. depends on that company's existing large-scale production of ethylene oxide.

Knapsack and Uhde claim that putting acrylonitrile manufacture on an ethylene basis is a distinct advantage, from standpoints of both availability of raw materials and safety.

Shaving the Cost: Knapsack estimates that the investment needed to build an acetaldehyde-route plant would be approximately 10% below that needed for a conventional acetylene-route facility, and that the operating costs would be about the same. However, the big saving is expected in the materials, which constitute about two-thirds of the final acrylonitrile cost. Figured on an equivalent basis (two carbon atoms and two hydrogen atoms), acetaldehyde is estimated to cost about 15% less than acetylene. Since acetaldehyde makes up about 60% of the feed material, the over-all saving is 9%.

The higher yields of the acetaldehyde process also produce savings, since the raw materials are more efficiently utilized. Knapsack has achieved yields averaging 91%, using acetaldehyde, compared with 80% yields from acetylene.

Thus, the combined saving from lower cost and greater utilization is about 20%. And, at two-thirds of total cost, finished acrylonitrile can be made for 13-14% less by the new route.

Purity Problems Overcome: An additional advantage of the switch from acetylene to acetaldehyde is the avoidance of troublesome impurities. Two particularly bothersome by-products of the acetylene process—methyl vinyl ketone and divinylacetylene — have boiling points close to that of acrylonitrile, are consequently difficult to separate. In addition, the tolerance level for these two compounds is very low, since they would copolymerize with the acrylonitrile and impart undesirable characteristics to the finished polymer.

Lactonitrile—the Key: The problem attending previous attempts to make this route work lay in the instability of lactonitrile, particularly at the temperatures needed to dehydrate it into acrylonitrile.

It was this particular problem that led Carbide to the use of the more stable, though more costly, ethylene oxide product — ethylene cyanohydrin — in the first place (before commercialization of the direct acetylene route).

Knapsack's persistent efforts to make the direct acetaldehyde route work paid off, however. The answer lay in carrying out the dehydration in a split second in the presence of concentrated phosphoric acid. Conversion into acrylonitrile under these conditions ranged from 65%-70%, with the remainder of the lactonitrile decomposing into the starting materials. With recycling, total yield was boosted to more than 90%.

How It Works: The Knapsack process, as described in U.S. patent 2,790,822 and in the July issue of *Chemie-Ingenieur-Technik*, consists of two main steps. In the first, the lactonitrile is produced and stabilized; in the second, it is dehydrated into

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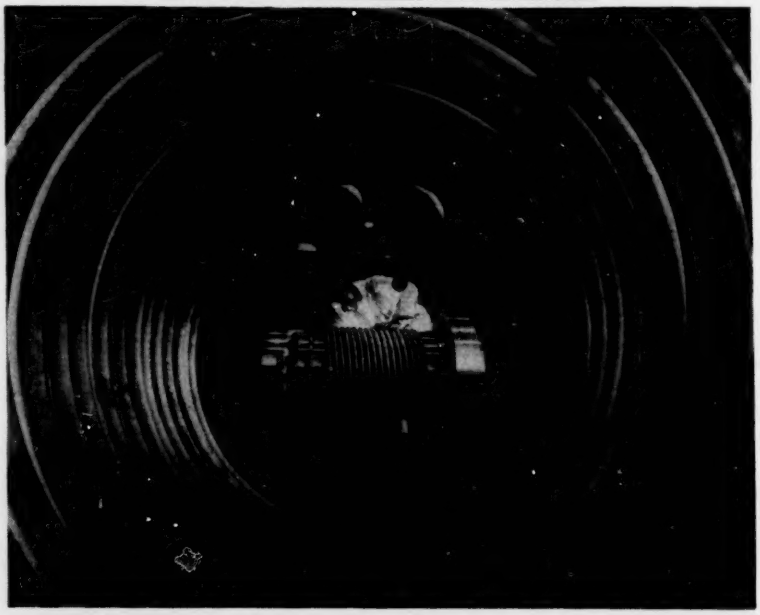
the final product, acrylonitrile.

In the first step, hydrogen cyanide is neutralized (to pH 7-7.5) with 20% caustic soda in a reaction vessel. Addition of an exactly equivalent amount of acetaldehyde with agitation produces lactonitrile, which is then stabilized by addition of 0.2-0.5% of phosphoric acid.

The dehydration takes place in a atmospheric-pressure, vertical tube. More phosphoric acid is added to the stabilized lactonitrile until the nitrile-acid ratio is about 2 to 1. This mix is forced into the reaction tube by nitrogen under pressure. At the same time, hot oxygen-free combustion gases (produced at 1500 C in an adjoining chamber to maintain a temperature of 600 C in the reaction tube) are injected at right angles to the finely divided spray of reaction mixture entering the top of the tube. Dehydration takes place in about 0.1-0.6 seconds. Reaction products drop through the tube, are quenched and separated.

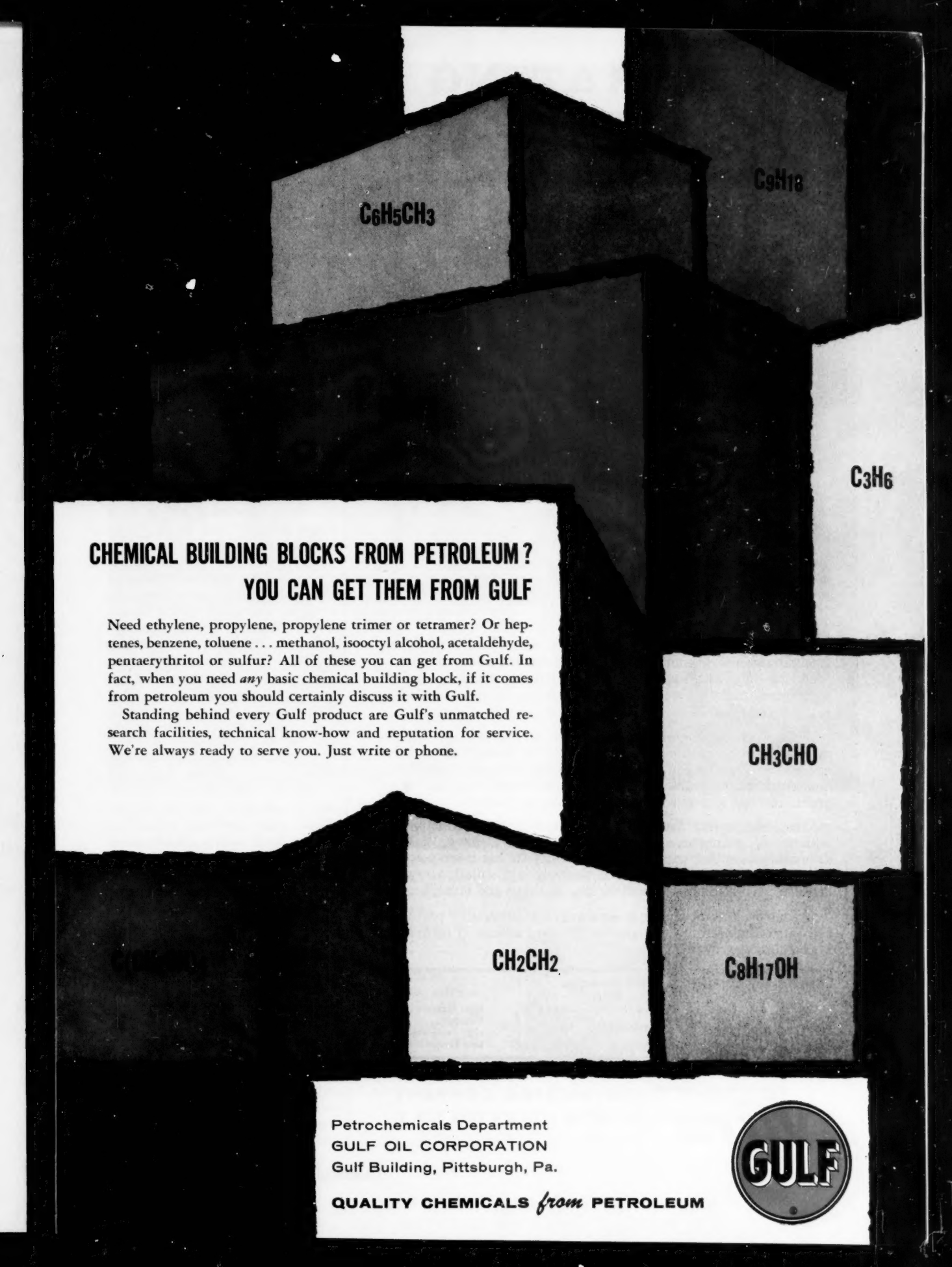
The bulk of the phosphoric acid emerges as 30% acid, is reconcentrated and recycled. A small amount of ammonium phosphate is also produced and recovered for sale or use. Although Knapsack is currently using a batch process to turn out 100 tons/-month of lactonitrile, the method may easily be made continuous for larger quantities to meet future acrylonitrile demand. One other contender is the nitrogen tetroxide oxidation of propylene, followed by ammonolysis and dehydration of the resulting lactic acid. Escambia Chemical Corp. holds a recent patent (U.S. 2,847,464) on the first step of this method (*CW Technology Newsletter, Aug. 23*). And vapor-phase reaction of acetylene and hydrogen cyanide is another possibility (present facilities are liquid-phase).

Acrylonitrile's biggest user, Du Pont, is not a producer of the material, but it is known to be evaluating a number of methods for possible use. Du Pont says, however, it has



Belgian Reactor Readied for Export

Westinghouse plants are this week readying components of Belgium's first nuclear power plant. The 300-hp. canned pump, viewed through a set of cooling coils *(above)*, is one of two that will circulate 6,250 gal./-minute of pressurized water through the primary heat-exchange loop of a plant at the Belgian nuclear center at Mol (near Brussels). The reactor —an 11,500-kwe. pressurized-water system fueled with uranium oxide— will be put into operation late next year by Bureau d'Etudes Nucleaires, a syndicate of Belgian utilities and industrial concerns.



CHEMICAL BUILDING BLOCKS FROM PETROLEUM? YOU CAN GET THEM FROM GULF

Need ethylene, propylene, propylene trimer or tetramer? Or heptenes, benzene, toluene . . . methanol, isooctyl alcohol, acetaldehyde, pentaerythritol or sulfur? All of these you can get from Gulf. In fact, when you need *any* basic chemical building block, if it comes from petroleum you should certainly discuss it with Gulf.

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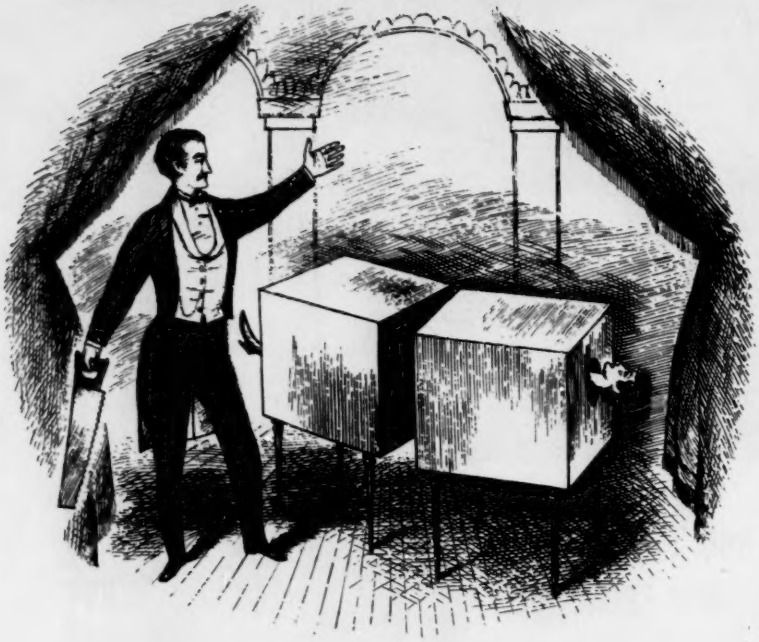

The inseparables of yesterday—heavy water and light water, uranium isotopes, lithium isotopes, rare earths and plutonium fission products—have long since yielded to revolutionary new separations techniques, many of which were brought to maturity by Vitro Engineering Company.

While these techniques were developed to separate the inseparable, they are equally applicable to a wide variety of chemical operations. The company failing to consider them in expansion or modernization programs may be ignoring a sure route to higher profits through improved production or higher purity.

Vitro Engineering Company has been a pioneer in many new separations techniques—solvent extraction, ion exchange, gaseous diffusion, adsorption and chemical exchange. It has given new efficiency to older techniques, such as electrolysis, distillation, crystallization, absorption, ore beneficiation, leaching and volatilization.

If your projects pose unique separations or processing problems, call Vitro Engineering Company for the most advanced techniques in chemical engineering.

VITRO HAS SOLVED THESE SEPARATION PROBLEMS:

Gas ....*from*....Gas	Liquid ...*from*...Liquid	At:	High Pressure
Gas..... " .....Liquid	Liquid.... " ....Solid		Vacuum
Gas..... " .....Solid	Solid..... " ....Solid		High Temperature
			Low Temperature

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not come to a firm decision on whether to enter the field.

In any event, potential producers will have to think twice now before bypassing the acetaldehyde route.

PROCESSES

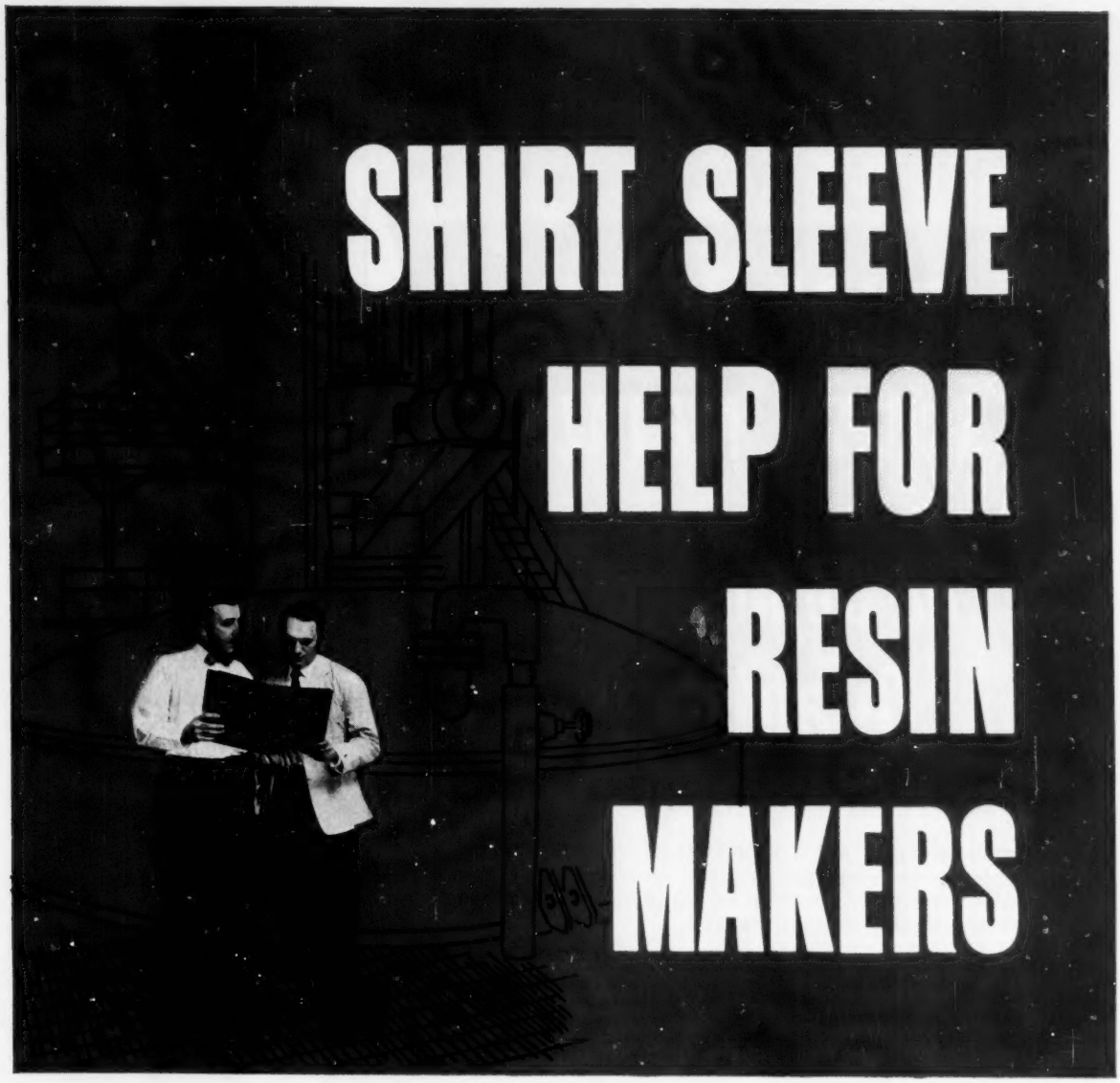
Plated Foil: American Smelting and Refining Co. is now pilot-producing zinc foil by a new process developed at its central research laboratories at South Plainfield, N.J. In the new process, zinc is deposited electrolytically from a zinc sulfate bath onto a revolving drum, from which it can be stripped in a continuous sheet up to 26 in. wide in uniform thickness in the range of 0.001-0.005 in. The electrolytic process is reportedly more economical than conventional foil-rolling techniques; electrolytic foil is said to have high chemical purity, unique ductility and tensile strength. Asarco is considering putting up a larger-scale pilot unit at its Corpus Christi, Tex., plant.

•

Cat-Cracking Booster: Results of plant-scale tests conducted jointly by Linde Co. and Cities Service Oil Co. indicate that the use of oxygen-enriched air for catalyst regeneration can boost catalytic-cracking capacity 15% at standard conversion rates. Tests were conducted at the Cities Service refinery at East Chicago, Ind., using oxygen additions of up to 150 tons/day to provide enrichments of up to 27% by weight. Temperature control, oxygen utilization (pounds of oxygen per pound of coke burned), oxygen content of flue gas, and residual coke on the regenerated catalyst, Linde reports, did not change appreciably from normal operating conditions encountered with air. Net effect of adding 100 tons/day of oxygen (25.5% enrichment) was to increase conversion of feed oil about 5% by volume at constant feed rate, or to increase feed rate 15% by weight at constant conversion. In either case, says Linde, the value of additional product offsets cost of the oxygen.

•

Iron Oxide: Degussa (Deutsche Gold- und Silber-Scheideanstalt, Frankfurt, Germany) has received a preliminary patent (DAS 1,034,163) on a new process of making ferromagnetic oxide. The method involves combustion of iron chloride in a water-



IF YOU'RE just beginning to manufacture alkyd or polyester resins—or an "old-hand" producer with some production problems still unsolved—Pittsburgh's Technical Service Department may be of real service to you.

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This help goes well beyond "samples and data sheet" on our products—which are always available, of course. We'll be glad to make up sample resins, suggest formulations for your special requirements, and recommend sound processing procedures.

And, when the problem calls for it, our engineers are at your service for a trouble-shooting meeting at your plant. Pittsburgh is *not* a commercial resin producer.

What's your resin production problem? We'd like to help you lick it. *Call or write us the details today.*

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Metallurgists, Nuclear Engineers: Michigan Chemical can now supply ingots of Gadolinium, Yttrium, Dysprosium, and Erbium metals in substantial poundages for use in nuclear control rod, shielding, or alloy system applications.

METAL	MELTING POINT °C	BOILING POINT* °K	ATOMIC RADIUS	DENSITY GRAMS/CUBIC CENTIMETER	THERMAL-NEUTRON CROSS-SECTION (BARNS)
Y	1552	3300	1.81	4.47	1.38
Gd	1350	3000	1.8	7.87	46,000
Dy	1400	2600	1.77	8.56	1,100
Er	1500-1550	2900	1.75	9.06	166

*Estimated

Discuss with us availability and prices on commercial quantities. This will permit you to analyze the economic and technological advantages of rare earth metals versus other metals — for example, Gadolinium versus Hafnium in nuclear control. This will also permit the evaluation of special alloy systems such as Gadolinium in stainless steel.

RE-58-1

RARE EARTHS AND THORIUM DIVISION

MICHIGAN CHEMICAL CORPORATION

584 North Bankson Street, Saint Louis, Michigan

*Reg. U.S. Pat. Off.

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producing flame, followed by coagulation and separation of the iron oxide (Fe_2O_3) aerosol produced by the flame reaction. Laminar injection of iron chloride vapor into the flame is essential, says Degussa. Preferred flame-gas mixture: hydrogen (or hydrogen-forming gases such as methane), 2.2 parts; air, 2.2 parts; nitrogen, 4 parts (by volume). Reaction temperature is held below 1000 C, preferably at about 800 C. Oxide produced by the new method, says Degussa, is of uniform grain size, has a highly active surface and shows optimal qualities in magnetic tapes.

•

Oil from Shale: Described at the recent American Chemical Society meeting was a method of converting Colorado oil-bearing shale into high-quality fuel gas. Called hydrogasification by Institute of Gas Technology (Chicago), where it was developed, the method is said to produce gas with 800 Btu./cu. heating value.

The process is claimed to be more efficient than those that extract oil from shale; it is said to make use of 90-100% of the organic matter in the shale instead of about 80%.

Hydrogasification is a one-step process in which crushed shale is reacted with hydrogen at high temperature and pressure. Estimated cost of the finished gas: 30¢/1,000 cu.ft. (37½¢/million Btu.).

•

Mixing System: A system for mixing gases and liquids at the lowest energy requirements has been developed by Oesterreichische Stickstoffwerke AG. (Linz, Austria). Essentially a horizontal cylinder with three main inlets and one outlet, the system includes as its novel feature a number of baffle plates fitted with small, variously angled pipes to divert the stream entering at one inlet. The streams coming into the other two inlets are passed through a perforated steel sheet before contacting the material entering the other inlet. The space between the baffles and the sheet is thus fed by many small streams of fluid. The resulting turbulence performs the mixing at very low primary energy levels. The pressure of the system is adjusted so that no outlet pump is needed.

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AA QUALITY Sodium Fluoride is also used in the production of rimmed steel. Reacting with the "pour" in the ingot forms, the *uniform, high-quality* chemical reduces viscosity of the non-ferrous elements so they are carried to the surface of the molten metal with escaping, entrained gases for easier, more thorough separation.

For further information about AA QUALITY Sodium Fluoride or any other AA QUALITY Chemical, please write to our Research Department on your letterhead. Data sheets and free samples will be furnished gladly.

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Technology
Newsletter

CHEMICAL WEEK
September 27, 1958

A new process for making sponge iron from iron ore by reduction with natural gas has been developed by Fierro Esponja, S.A. (Monterrey, Mexico), with an engineering assist from The M. W. Kellogg Co. (New York), exclusive sales and licensing agent. Fierro Esponja, an affiliate of Hojalata Y Lamina, S.A., had proved the economic feasibility of the process in a 200-tons/day plant, and last week awarded Kellogg a contract for a 500-tons/day facility.

Several major steel producers have been pursuing direct iron reduction processes (*CW, Jan. 26, '57, p. 94*) for economical, small-scale iron production (blast furnaces must be big to be economic) in areas where supplies of coal and limestone (conventional blast furnace raw materials) are limited.

Fierro Esponja's success in this field, Kellogg says, lies in its techniques of gas reforming and heat recovery, which ensure high thermal efficiency. The gas, the reducing medium, can be made from either natural gas or petroleum. At the Monterrey plant, sulfur-free reducing gas containing 85% hydrogen and carbon monoxide is produced from natural gas in Kellogg high-pressure steam reforming furnaces. Actual reduction of the iron ore takes place in fixed-bed reactors, each of which holds about 105 tons of ore. Sponge iron from the reactors is conveyed to cars via a hopper and chute, can be either sent directly to electric furnaces or stored for later shipment to steel plants.

The new 500-tons/day plant Kellogg will build is to incorporate improved heat recovery facilities, as well as some evolutionary modifications in the design of reduction reactors.

•

Ozone treatment is cheapest effective way to sterilize sewage, according to a just-published U.S. Army Chemical Corps study. The Corps' Biological Warfare Laboratories at Fort Detrick (Frederick, Md.) and Armour Research Laboratories (Chicago, Ill.) based this conclusion on lab trials of a number of disposal methods. Favored plan: bubble ozone through tall columns of liquid waste. Ozone has a long history of success in treating water supplies in Philadelphia, and Whiting, Ind., and in Europe, but hasn't been used on sewage. Details of the study are in report No. PB 129375 ($3 microfilm, $6.30 photoprint) now available from Photoduplication Service, Library of Congress, Washington 25, D.C.

•

A huge plant for making straight-chain primary alcohols from petroleum is being planned by Continental Oil Co. Called Alfols, the products of the multimillion-pound facilities range in chain length from six through 18 carbon atoms (or more if desired). All contain even numbers of carbon atoms and most have been available in the past from only conventional processes using natural oils and fats as the starting materials.

Conoco says its new process is based on Ziegler chemistry and has been under development for nearly five years. The Alfols will be cheaper and in more stable supply than the naturally-derived compounds, Conoco believes, and will find use in making synthetic detergents, lubricating oil additives, plasticizers, cosmetics, emulsifiers and paper and textile chemicals. The plant will be at Ponca City, Okla.

•

That contest to find new uses for microscopic glass beads (*CW Technology Newsletter, July 5*) has turned up 213 potentially valuable suggestions.

Microbeads, Inc. (Toledo, O.), which spent only about $20,000 on the contest, tallied about 1,500 ideas submitted by researchers in more than 700 companies. Some proposals: use of the spheres in conjunction with plastics to reflect and diffuse heat in rockets and missiles, etc.; as a settling aid in water treatment; to improve the operation of silicon wafers in solar cells; and as a tare in chemical weighings.

•

New method of determining size distribution of cracking catalysts has been turned up by Shell Development Co. (Emeryville, Calif.). Shell's secret is a fine-mesh sieve, with square holes as small as 0.0002 in. on a side, made by a photographic-electroplating process. (Woven wire screens are unreliable in this range.) With this screen, particles needed to maintain optimum surface area for the cracking process can readily be "sifted" out from catalyst samples of particles ranging from 0.004-in. diameter. Stack loss of catalyst can be reduced sharply, says Shell. Said to be quick and accurate, the system may be accepted as a standard by American Society for Testing Materials.

•

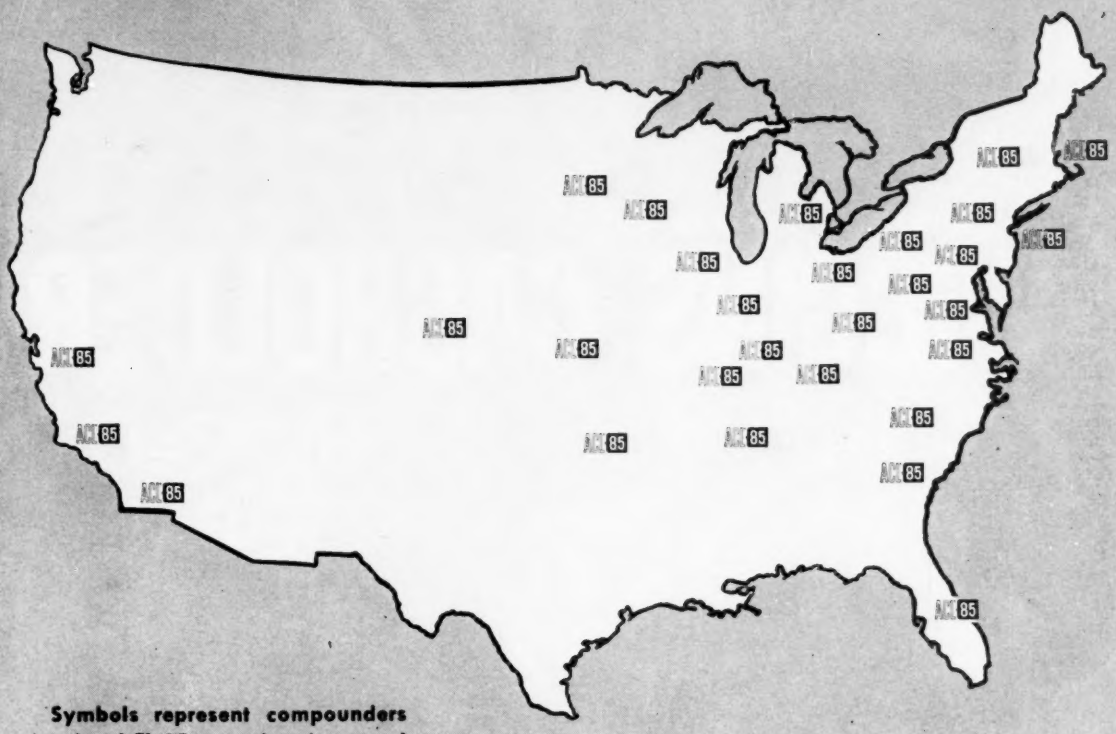
Cross-linked dicarboxyl starch may find use as a thickener in products ranging from oil-well drilling muds to cosmetics. Newly developed at U.S. Dept. of Agriculture's Northern Utilization Research and Development Division (Peoria, Ill.), the modified starch forms a high-viscosity paste when heated in water but, unlike starch, does not jell when cooled.

•

Tricky new way to remove atomic fallout: spray on a special asphalt emulsion, then simply rake it off. The plan seems best suited for removing surface fallout contamination from croplands after a nuclear accident or atomic attack.

University of California (Berkeley) soil scientists working on an Atomic Energy Commission-sponsored project discovered the isotope scavenger while testing several decontamination treatments. The emulsion's high effectiveness (97% removal of the fallout material) and low cost have prompted U.S. Dept. of Agriculture researchers to begin field tests at the USDA research center in Beltsville, Md.

Commercial laundries changing to higher quality dry bleaches



Symbols represent compounders using ACL-85 to produce improved dry bleaches requested by the commercial laundry industry.

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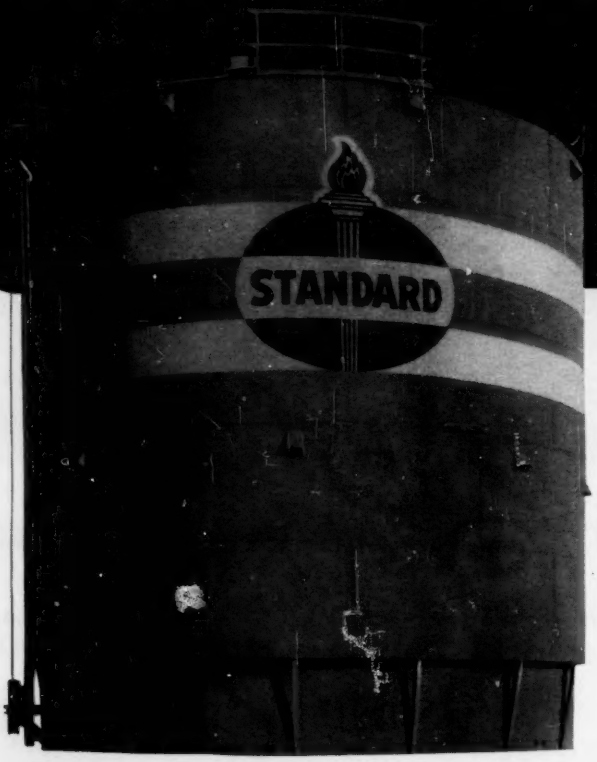

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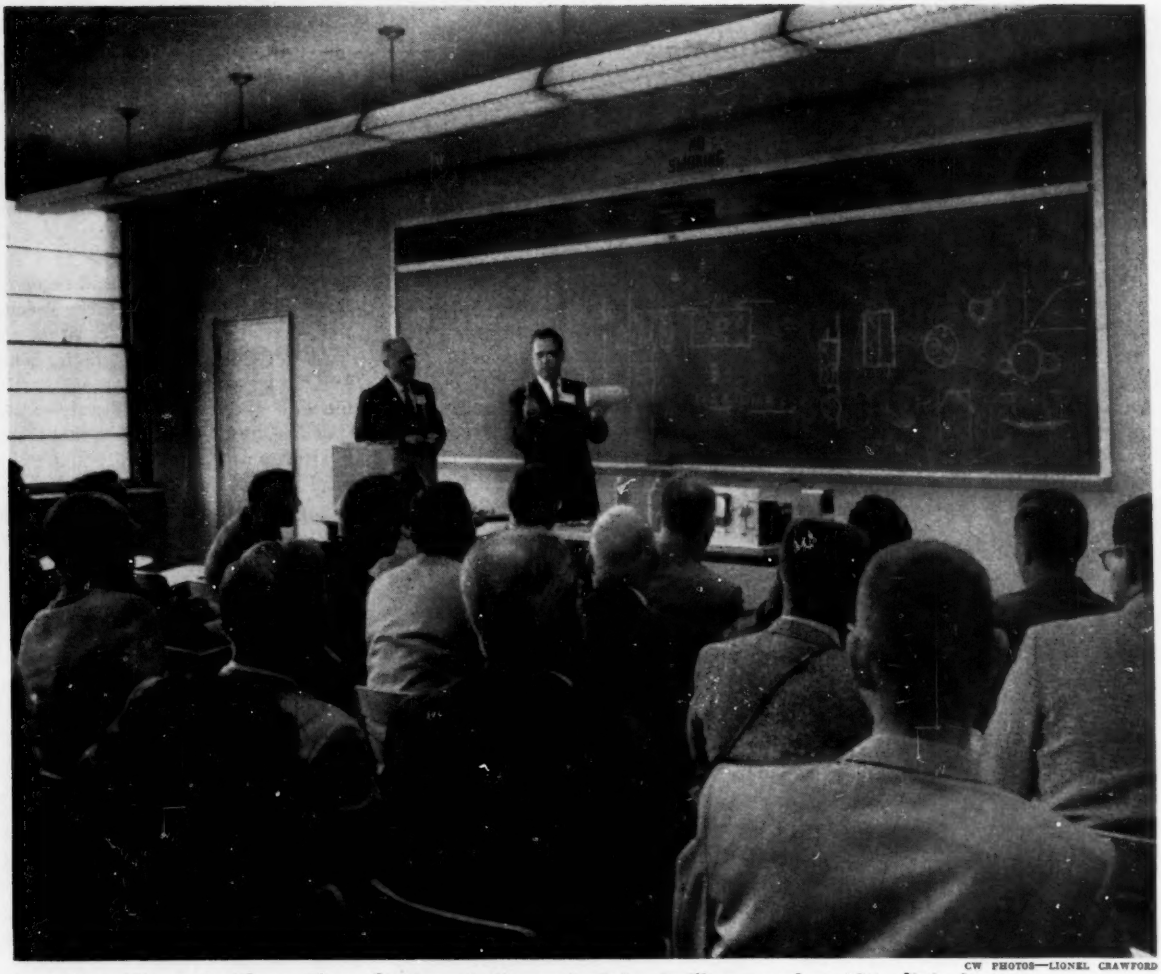


CW PHOTOS—LIONEL CRAWFORD

American Viscose's Glenn Clem (left) and Ohmart's John Poliksa conduct ISA clinic lecture.

Concentrating on Technician Training

There was a double bonus for representatives of chemical firms attending Instrument Society of America's instrument-automation conference in Philadelphia last week. Besides usual technical talks and instrument displays, two conference sessions hit directly at the biggest problem facing instrument users—training qualified plant instrument men.

Starting with the conference-opening, two-day training clinic for industry's instrument men (*above*), ISA continued its trend toward stressing needs of the users rather than hardware of the suppliers. For the first time, users were persuaded to co-lecture with makers, supply information on installation, operation and maintenance of the instruments in specific applications.

And, at a later workshop session, educators from college, technical and vocational schools met with industry representatives to discuss technician training. They came up with clues for filling industry's needs for qualified instrument men—clues that could cut industry's training costs.

Just a Start: But the workshop's training hints aren't conclusions; they must be sifted for points to fit specific needs.

And requirements for the simplest training courses are often difficult to fill. For example, ISA's two-day conference clinic, revamped this year to cover actual plant use of instruments, ran into instructor problems. Many "user firms," even if they had qualified lecturers, didn't want to detail their plant applications, also felt that to appear on the same program with an instrument maker might imply their endorsement of the instruments discussed. Nonetheless, chemical and petroleum firms supplied lecturers to fill seven of 10 courses given in their fields.

At the workshop session, Harry Furry, director of training at The Fox-

boro Co., pointed out many problems of longer, more general courses conducted by instrument makers and users. Among the problems: course content, time and instructor availability, cost, trainee selection.

What Industry Wants: Although technical and vocational schools are offering some courses for instrument technicians, basic training is still industry's job. "For some 25 years, the instrument manufacturer and user have carried out efforts to educate instrument people—not because they have wanted to, but because they have had to," says Furry.

All the workshop representatives agreed that training was their major problem. But, Lloyd Slater, executive director of Foundation for Instrumentation Education and Research and moderator of the workshop, pointed out, there was no agreement how industry wanted educators to help. In fact, an instrument engineer from one large chemical company stated that his firm would not hire technical school graduates. He gave two reasons: (1) it needed technicians with specific rather than general instrument knowledge, and (2) union problems (i.e., filling instrument technician jobs with employees lacking seniority).

However, the training representative of an oil company saw apprentice training as the area in which educators can supply help. His company feels that the other technician training areas—i.e., job upgrading and updating programs—are strictly company responsibilities.

Furry sees the big problem of the technical school in "hardware" courses —no school can hope to have all types of hardware. Instrument maker and user both will still have to give instruction on specific instruments and applications. But, Furry says, schools can give the trainee the "why" of basic instrument theory.

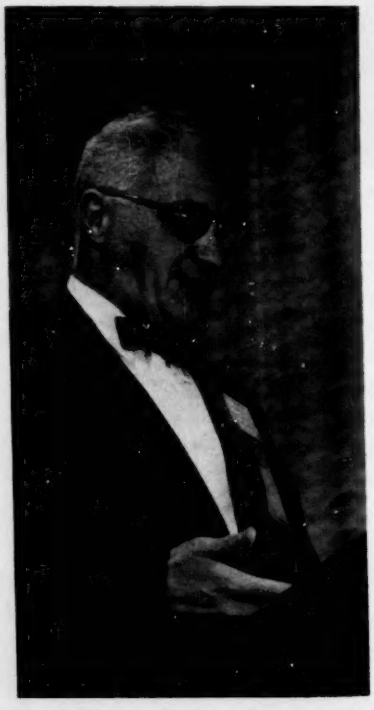
Burr Coe, director of Vocational and Technical High Schools in Middlesex County, N.J., described just such an apprentice course worked up by Hercules Powder Co.'s training department and the Middlesex vocational guidance department. The course is used to upgrade mechanics (including instrument men) at Hercules' Parlin plant, has been expanded to include other companies in the area. This year, 20 men are in night school, trained by an industry instructor.

Says Coe: "Many people have overlooked what local vocational schools can do to train their men."

And Howard Hogan, consultant for employee-employer relations of U.S. Dept. of Health, Education & Welfare, pointed out that the new Public Law 85-864 can help industry with its training programs. He says that interested companies can get details from schools in their areas. In essence, the law provides $60 million over a four-year period for vocational education programs, provided the funds are matched by state or local areas. "Apprentice training can be a part of it," says Hogan.

Concerning costs, Furry added that only three of 33 instrument makers that offer courses make any charge for them. Yet, only a small fraction of the companies using a maker's instruments enroll trainees in the courses. "And all the companies are sharing in the cost of the schools when they buy the instruments," he says.

What's in a Name: Many of the workshoppers say unions are a stumbling block to training qualified technicians. Management doesn't have the full say on who is to receive the training; seniority determines that. Furry says part of the problem is tied to the instrument man's title: "Too many are called instrument mechanics. And until we realize that it is not just a trade, and educate both companies and trade unions to this fact, we won't get away from the problem. The unions must be convinced that a man with definite technical knowledge is needed."



Harnwell: A place in the university for instrument engineering.

Several workshoppers said recognition was necessary on other levels, too. Instrument engineering is not always recognized as a definite field. For example, Gaylord Harnwell, president of University of Pennsylvania, stated at the keynote session that there is a place within university and technical schools for curriculums in instrument engineering. Schools such as Case and MIT provide them; many schools do not.

But regardless of whether an instrument engineer studied in instrument engineering curriculums, he usually has a college degree.

The technician's status is seldom as well defined, but it is somewhere between that of the engineer and the skilled craftsman. Most technicians are high school graduates, whose further training has been planned around the technical specialty. And in such advanced courses, the trainee is often fitted for a management job.

These questions of status and background, of course, will bulk larger as more instrument experts join industry. For now, industry is primarily interested in filling the positions already open to instrument men—and last week's meeting provided many guides on training the needed manpower.

EQUIPMENT

Liquid Sample Cooler: Bird-Archer Co. (4337 North American St., Philadelphia 40) is out with a new liquid sample cooler that facilitates constant analysis of boiler water or other heated liquids.

•

Flow Indicator: A new digital flow indicator, Model DFI-2, is now being offered by Performance Measurements Co. (15301 W. McNichols, Detroit 35). High accuracy and close signal follow-up are claimed for the new unit, which is said to be relatively unaffected by variations in line

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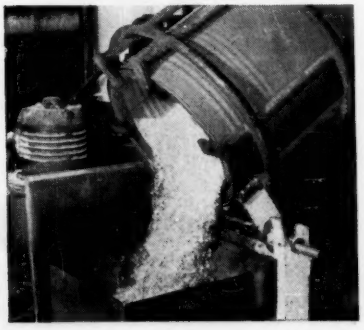

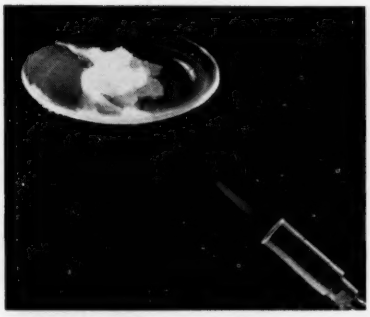

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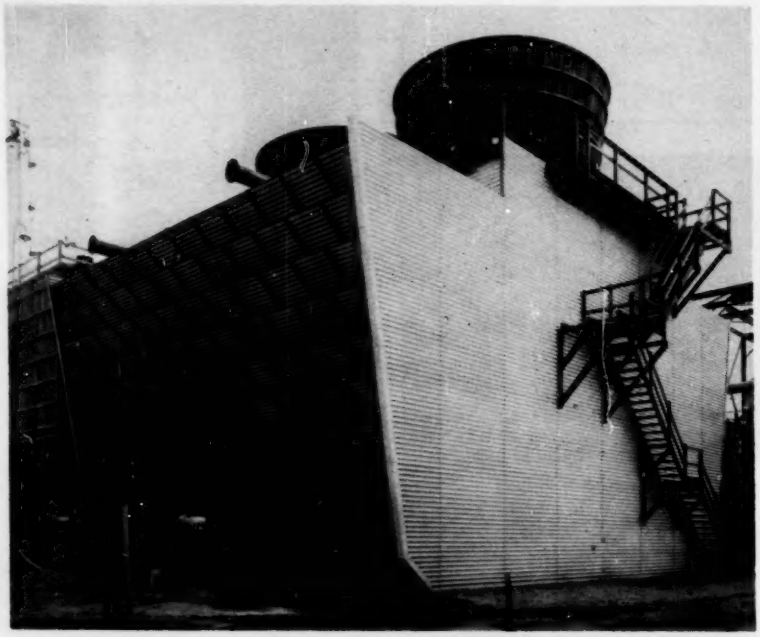
Air Tight Pump: The Electri-Cand single-stage, single-suction pump for liquids is a new product of Allis-Chalmers Mfg. Co. (Milwaukee). Available in capacities to 500 gpm. at heads to 250 ft., the new pump can handle volatile liquids at temperatures up to 200 F. It requires neither mechanical seal nor packing, has impervious carbon sleeve bearings.

•

Capillary Tubing: Metal capillary tubing in longest lengths yet sold are now being made by Superior Tube Co. (Norristown, Pa.). Depending on the dimensions, lengths up to 3,000 ft. are now available; previous maximum length was 500 ft. Principal use is in instrumentation, where remotely located sensing elements can now be connected to the indicating, recording or controlling sections with a continuous length of tubing. Instrument calibration is also said to be facilitated by the greater uniformity of tubing made possible by extended draws.

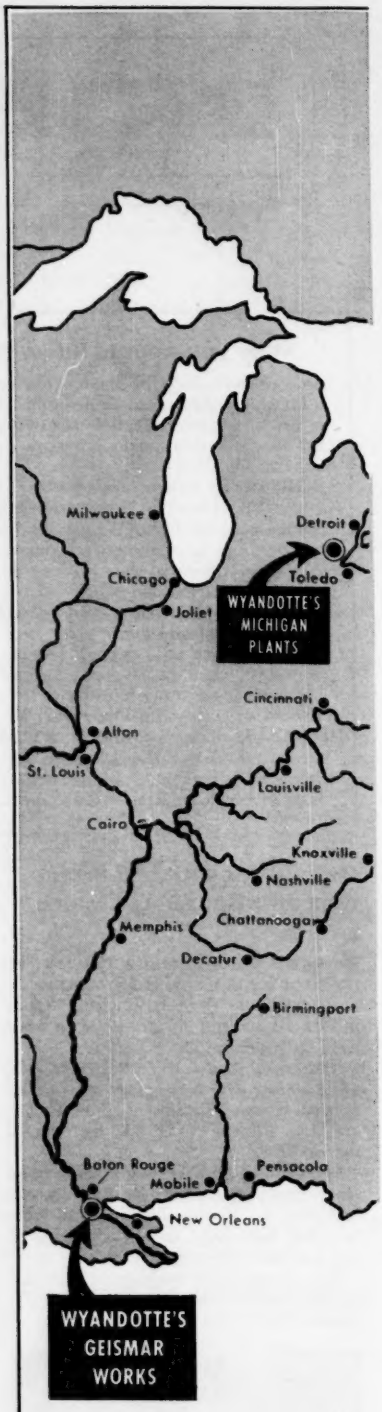
•

Classifier System: Suggested for particle-separation applications in the 400-200-mesh range is the new Centrifugal Classifier System of Buell Engineering Co. (123 William St., New York). A mixture of fine and coarse particles is blown into a series of chambers that direct the stream in a spiral; baffles separate different sizes of particles. The system has no moving parts, requires little maintenance, uses 0.04-0.5 hp./ton/hour. Sizes are available to handle 100 lbs./hour to 100 tons/hour.



New Slant Cuts Cooling Tower Icing

The slanting exterior of the new alkylation-area cooling tower at Esso Standard Oil's Baton Rouge refinery forms a sharp contrast with a conventional tower *(background, above)*. Although tower operation is conventional, the new design has larger louvers designed to reduce wintertime icing problems. Also, air drawn in through louvers blows the water inward so that less tower area is required for the base. And the water, with shorter distance to splash out, is less likely to freeze. The tower, designed and built by The Marley Co. (Kansas City, Mo.), has asbestos-cement louvers. Large sections are easy to put on, require few joints.



Something new has been added...

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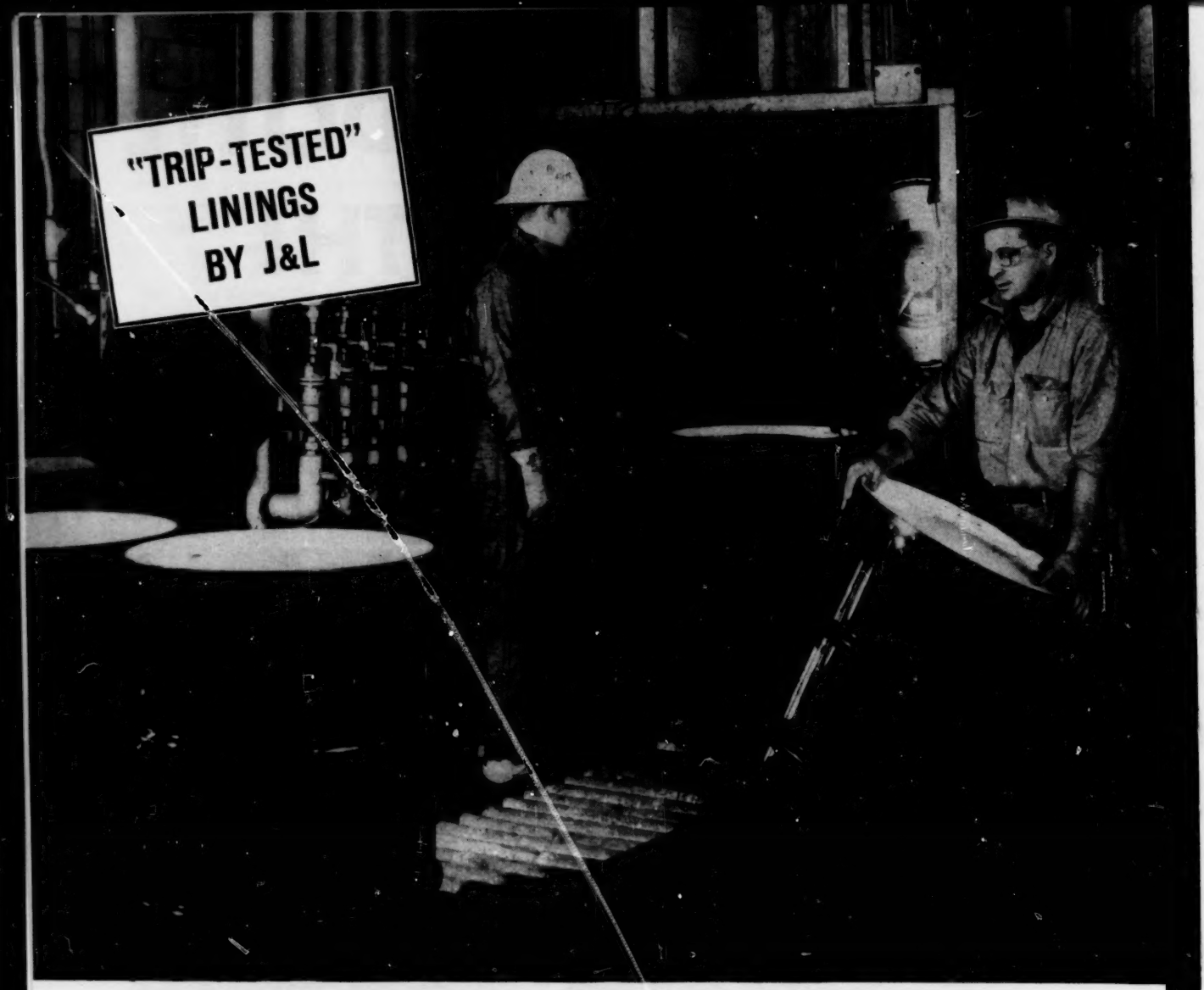

HOW J&L EPOXY-PHENOLIC LININGS

protect highly reactive liquids for Allied Chemical Corporation

"We package di-isocyanates in J&L steel 55-gallon drums lined with two coats of epoxy-phenolic to avoid contamination," says Mr. C. S. Woodwell, chemical engineer at Allied Chemical's National Aniline Division, Moundsville, W. Va. "Di-isocyanates must be packaged with extreme care, even protected from contact with moisture in the air."

Difficult packaging of this highly reactive material requires perfect linings and procedures. Drums obtained from the Jones & Laughlin Container Division have held di-isocyanates in perfect condition for over a year.

Extensive J&L laboratory tests and customer-service reports prove conclusively that J&L drums and pails can protect most difficult chemical and petroleum products.

Nine J&L container plants located near major chemical and petroleum producing areas provide fast, round-the-corner service. J&L lined containers—over 2,500,000 in 1957—have carried thousands of chemical products safely to their destinations.

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STEEL

Jones & Laughlin Steel Corporation

CONTAINER DIVISION

405 LEXINGTON AVENUE, NEW YORK, N. Y.

Market Newsletter

CHEMICAL WEEK
September 27, 1958

Germany's first postwar large-scale synthetic rubber plant was officially opened last week. The $29-million Bunawerke Huels installation is owned jointly by Chemische Werke Huels (50%), and by Badische Anilin- & Soda-Fabrik, Bayer, and Hoechst, which have equal shares of the other 50%.

Capacity of the plant will be 70,000 tons/year of buna rubber—instead of the originally planned 45,000 tons/year—when formulations are altered. It will operate at half capacity, however, until imported stocks of rubber from the U.S. are reduced and demand for domestic material increases. Additional small investments in the plant will boost capacity to 90,000 tons/year, and equipment installed will permit further capacity-doubling as the need arises.

West Germany's consumption of synthetic rubber this year is estimated to be more than 60,000 tons, which is 15,000 tons more than in '57, when total demand for rubber—both natural and synthetic—was 180,000 tons. More synthetic would have been used in '57, if supplies from abroad had been more plentiful.

West Germany's synthetic rubber output now amounts to only 12,000 tons/year (produced by Bayer and Chemische Werke Huels); this compares with 70,000 tons/year produced in East Germany—about 50% of which is exported to other countries of the Communist bloc.

•

One indication of the fast-increasing use of titanium alloys by the aircraft industry comes from the U.S. Air Force Air Materiel Command. The aircraft industry now uses titanium alloy fasteners (screws, bolts, rivets) at a 20-million-units/year clip. This compares with a relatively small 1 million/year used in '55.

•

New products, new facilities:

• New facilities for producing polyvinyl acetate beads are on-stream at Borden's Illiopolis, Ill., plant. The beads are used by manufacturers of hot-melt adhesives, printing inks, decorative coatings, lacquers, and can-lining formulations. The firm also produces PVAc beads in Leominster, Mass.

• Allyl chloride—a chemical intermediate—is now included in Dow Chemical's product line. The material is used to make allyl alcohol, glycerine, allyl amine, trichloropropane, and allyl substituted barbiturates.

• USP-grade potassium iodide is also added to the Dow line. Prices quoted, per pound in 150-lb. fiber drums: 600 lbs. or more, $1.40/-lb.; 300-450 lbs., $1.43; single drums, $1.45/lb.

• S. W. Shattuck Chemical (Denver) will offer uranium chemi-

cals—salts and oxides—made from depleted uranium, at prices "much lower" than prices of products made from natural uranium. Compounds to be marketed include: sodium uranate yellow, sodium uranate orange, uranium oxide black.

• Diethyl oxalate is offered by Aceto Chemical (Flushing, N.Y.). The material, used as a slow-evaporating nitrocellulose solvent, goes into manufacture of special barbiturates.

•

Stabilization of the pricing chaos in copper chemicals that results from erratic ups and downs in costs of electrolytic copper is the objective of Republic Chemical. The firm will hereafter quote prices—for copper sulfate and copper oxide—that will be firm for 12 months. Although this means there will be no price hikes in that period, reductions may be made if conditions warrant.

•

Essential elements of a sound national minerals policy for the aluminum industry were outlined this week by Lawrence Litchfield, Jr., vice-president of Aluminum Co. of America. At American Mining Congress' annual meeting in San Francisco, Litchfield emphasized these aspects of the proposed policy: the U.S. to (1) permit permanent importation of foreign bauxite on a duty-free basis, (2) establish an import quota and surplus disposal program for aluminum through negotiation with other countries, (3) encourage research and development to improve aluminum processing.

U.S. domestic supplies of metal-grade bauxite represent only 2% of world reserves, are of low grade, and would be quickly exhausted if imports should be cut off by international conflict, Litchfield noted.

While urging tariff-free imports of bauxite, he called for "adequate protection" against dumping of aluminum into U.S. markets by foreign producers.

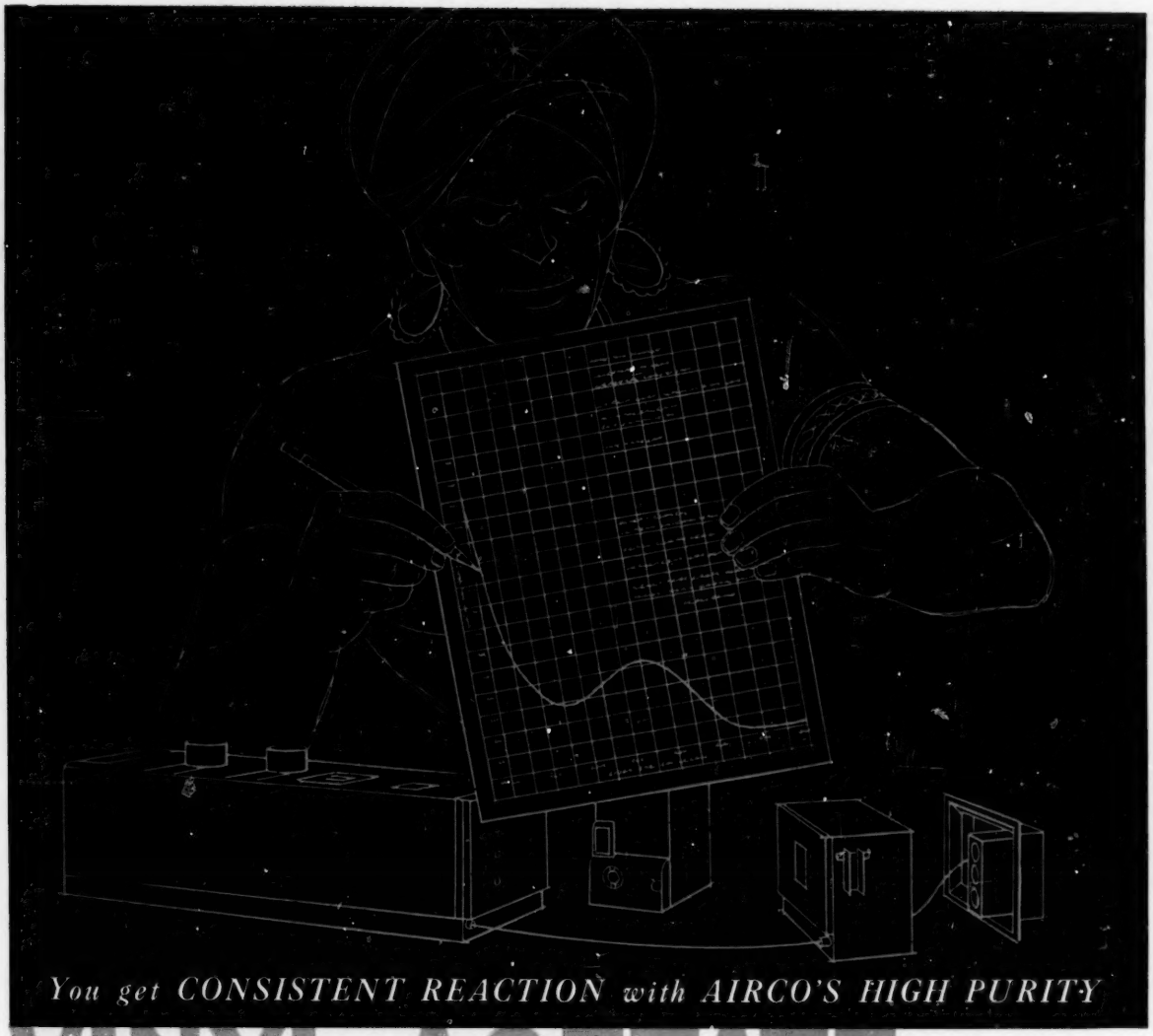
•

U.S.-produced shale oil is a potential economic competitor with Middle Eastern petroleum rather than with domestic-produced oil, and will "act as a long-term price stabilizer to offset price increases in foreign crude oil," Union Oil's Fred Hartley this week predicted at American Institute of Chemical Engineers' meeting at Salt Lake City.

SELECTED PRICE CHANGES — WEEK ENDING SEPTEMBER 22, 1958

	Change	New Price
UP		
Aluminum chloride, soln., 32-degree, cybs., c.l., wks.	$0.005	$0.0495
Aluminum sulfate, iron-free, cml., c.l., bgs., wks., coml., frt., equald., 100 lbs.	0.25	2.80
Lauric acid, 90%, dms.	0.01	0.31
Lead metal, prime, pigs., N. Y.	0.0025	0.11
Litharge, coml., powd., bbls., c.l., wks., frt. equald.	0.0025	0.1275
Lead, red, 95% Pb_3O_4 or less, bbls., c.l., wks., frt. equald.	0.0025	0.1325

All prices per pound unless quantity stated.



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AQUA AMMONIA (NH_4OH) — An economical source of nitrogen and an easily handled alkali.

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AMMONIUM SULFATE — Diverse uses include fireproofing, fertilizers, leather tanning.

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water solutions containing respectively 83% and 50% NH_4NO_3. For explosives, fluid catalysts, pharmaceutical applications.

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ETHYLENE GLYCOL — Also DI- and TRI-. Humectants, plasticizers, scrubbing solutions for gas dehydration, scores of other industrial uses.

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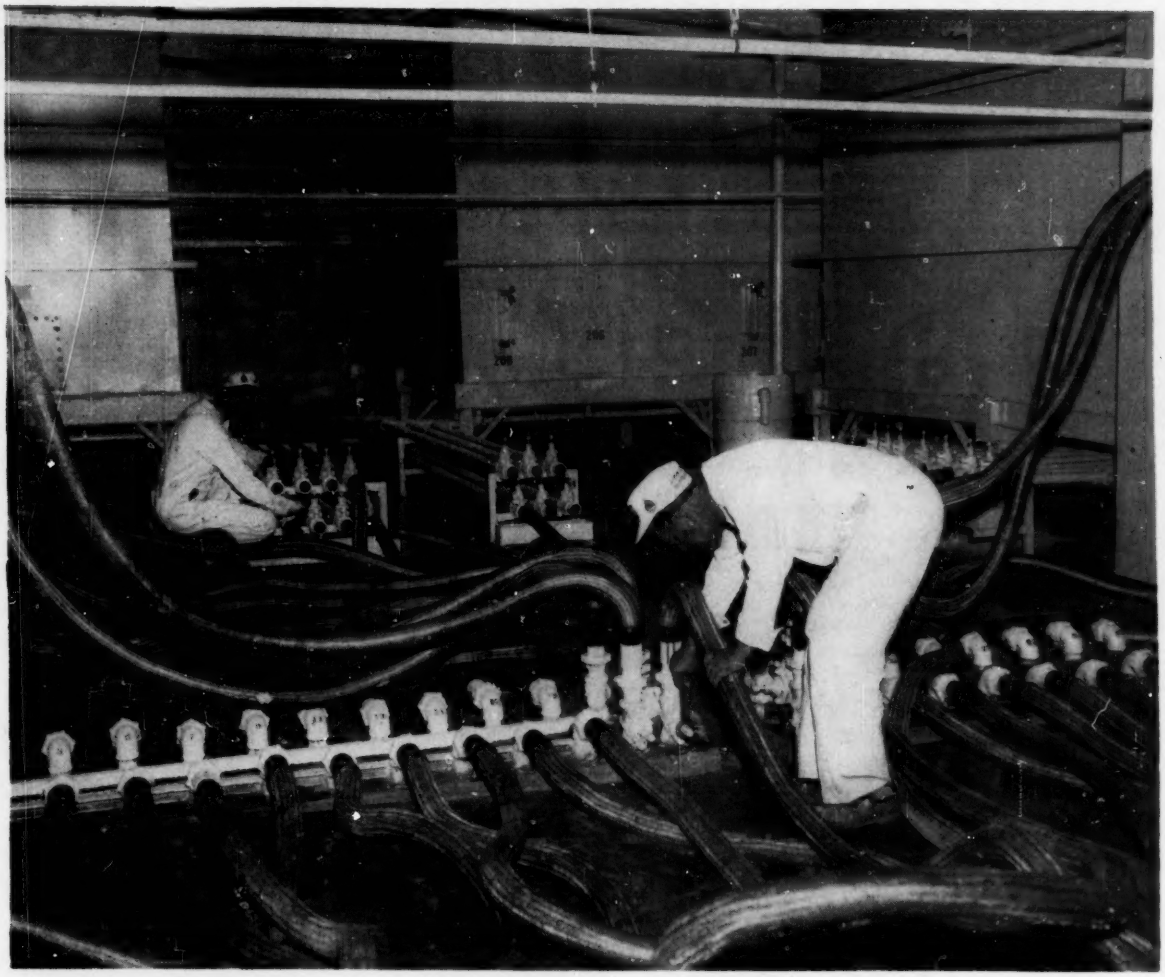

This maze of flexible hose lines carries varnish and processed liquids at S-W's new Garland plant.

Starting Southwest's Biggest Paint Plant

Sherwin-Williams is covering more of the earth this week. The big paintmaker has just opened a new, $4-million paint, varnish and lacquer plant on a 25-acre site in Garland, Tex. Largest of its kind in the Southwest, it will turn out 7 million gal. of product yearly.

The Garland installation, which replaces a 40-year-old plant at Dallas, will turn out the complete Sherwin-Williams line, including trade (general retail), industrial, automotive, transportation, graphic arts and industrial maintenance finishes. In addition, it will serve the pigment, color and chemical division's customers. The plant's sales areas include Texas, Louisiana, Mississippi, New Mexico, Oklahoma, Arkansas, Colorado, Kansas and parts of Missouri, Alabama and Florida.

The new plant includes 10 buildings and three tank farms. A four-story main structure, with 50,000 sq. ft. of floor area, houses the paint manufacturing facilities. It is flanked by a 40,000-sq. ft. raw materials warehouse on one side and a 120,000-sq. ft. finished goods warehouse on the other. In front of the paint plant is a two-story office and laboratory building and in back of it is the varnish production unit. Total floor space is more than 250,000 sq. ft.

One interesting feature of the installation is the eight-mile piping system through which materials move from the varnish-solvent storage plant to the paint plant.

Most of the plant's 250 employees moved to the new installation from the Dallas plant.

The Garland plant is one of 15 Sherwin-Williams manufacturing facilities in the U.S. The company has three plants in California (Los Angeles, San Leandro and Oakland), four in Ohio (Cleveland, Hubbard, Dayton, Deshler), three in New Jersey (Newark, Gibbsboro and Bound Brook) and units in Coffeyville, Kan., Detroit, Mich., Pittsburgh, Pa., and Chicago.

SOLVENT RECOVERY BOOSTS PROFITS

SAVE 65% TO 80% ON PROCESS SOLVENT COSTS

Solvent recovery by the COLUMBIA Activated Carbon system means increased profits for you. That's because this solvent recovery method recovers practically all volatile solvents and solvent mixtures—safely, efficiently and economically. When you use this solvent recovery system . . .

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- Solvents can be reused indefinitely. During periods of solvent shortages, efficient recovery is invaluable.
- Fire and health hazards are reduced and you have a closer check on solvent evaporation rates.

Solvent recovery plants are designed to suit your particular needs—from 50 gallons to 100,000 gallons a day. In most cases, *solvents can be recovered with an efficiency of more than 99% at a cost of 1 to 2¢ per pound.* Thus, you save 65% to 80% on your process solvent costs. The investment is moderate too. Some recovery plants running at capacity pay for themselves in less than a year. Under other conditions, it takes only two or three years.

CARBIDE can tell you how a solvent recovery plant can cut your processing costs. Write now for the booklet, "Solvent Recovery by the COLUMBIA Activated Carbon System." Address Department B, Union Carbide Olefins Company, 30 East 42nd Street, New York 17, New York.

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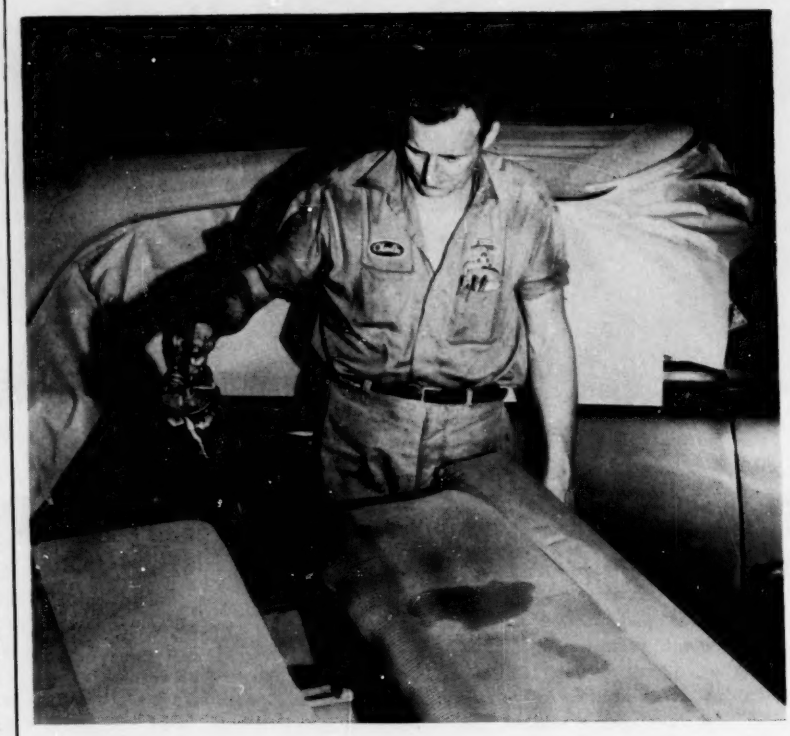
Unsnug Without Rugs

Makers of rug-cleaning specialties will find some provocative conclusions in a recent study made by the Chicago Tribune and the Carpet and Rug Cleaners Institute of Chicago.

After "psychoanalyzing" some 500 Chicago housewives to learn their feelings about rug cleaning, the investigators have apparently determined that feelings of guilt and fear surround the entire subject of carpet and rug care. If loose rugs are sent to the cleaners, the homeowners feel disorganized, insecure and depressed — feel as if they were in a cave. Wall-to-wall carpeting, on the other hand, brings up fears of having strangers in the house. If the rug is sent out for cleaning, most housewives feel that their rugs are being "beaten" and "mistreated" by the cleaners. If the job's done in the home, there's usually fear of shrinkage, along with the belief that "harsh chemicals are used that are detrimental to the fibers."

Most homemakers (54%) thought that rugs should be cleaned professionally once a year; 14% favored once every two years; 9%, every three; and 7% were against any professional cleaning.

Among people who cleaned their own rugs at home, more than half said they like the product they use. Objections to use of home products ranged from "too much work" (27% found this a fault), to complaints that "rugs were not as clean as if done professionally" (7.8%), to the feeling that self-cleaned rugs "got dirty quick-



Color Converter for Convertibles

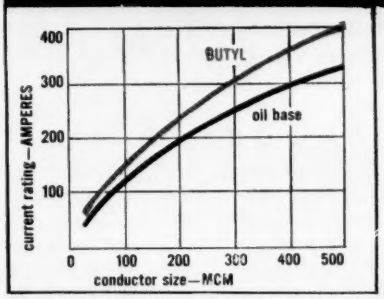
A new liquid vinyl color spray that recolors and refinishes automobile interiors and convertible tops without changing the original texture of the fabric is being nationally distributed by Toussig Co. (Philadelphia).

The sprayed finish, Aurora Lasticolor, is available in 12 colors plus black and white, at $5.95/qt. (Reducers used with the finish cost about $3/qt.)

A single coat of the finish is said to be enough for most applications. It takes about a half-hour to apply the new coating to the convertible top, another 10 minutes for it to dry.

ENJAY BUTYL

BEST WAY TO HANDLE ELECTRICITY



Butyl's outstanding resistance to heat allows considerably higher currents for any given conductor size.

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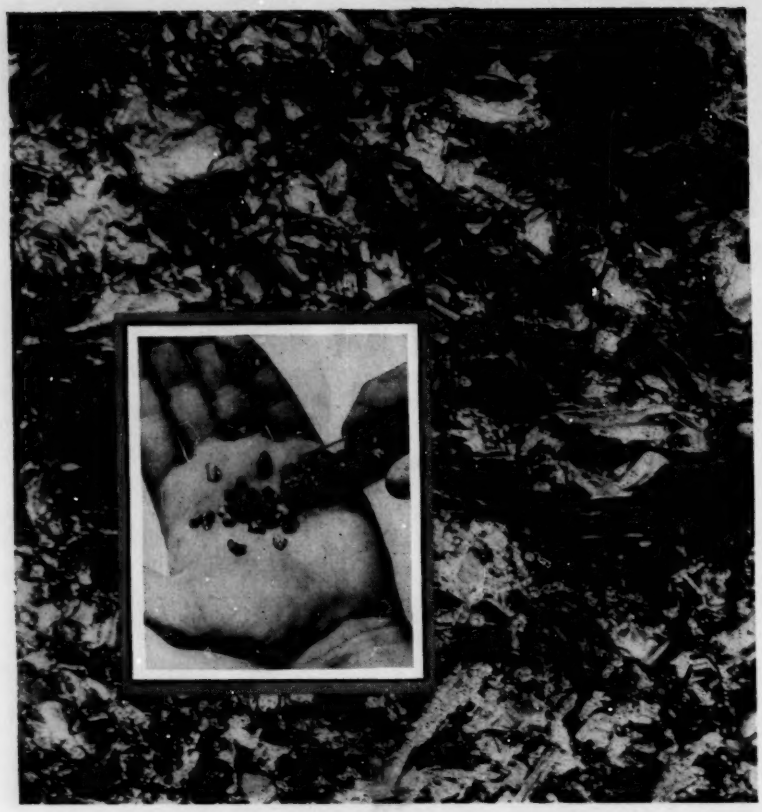

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Experimental samples of Crystalline Boron can be furnished in a variety of mesh sizes. Samples are usually furnished in small chunks, about the size of a pea. Write to us on your company letterhead, directing your inquiry to our Product Development Department.

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SPECIALTIES

er" (5%). In households where both professional cleaning and self-cleaning have been practiced, the professional cleaning was preferred by four out of five householders. Many women, however, home-clean their rugs, although they prefer the professionals' job. They say it gives them personal satisfaction.

Johnson Buys Perma

S. C. Johnson & Son, Inc., (Racine, Wis.) has just purchased the Perma Stamp Corp. (Los Angeles). With the Perma purchase, Johnson gets patent rights on Porelon, a new synthetic material in which liquid can be incorporated during manufacture, then given off at a predetermined rate (*CW, Nov. 2, '57, p. 84*). Porelon's "abundant product possibilities," says Johnson, include a nonrubber printing stamp (giving 50,000 impressions without being re-inked), bandages with built-in medicaments, cigarette filters, self-lubricating bearings, dry batteries and waterproof sheeting. Johnson is investigating Porelon's possibilities for its own product lines, as well as offering to license other manufacturers that might use Porelon to develop new products.

New Push for Polymer

B. F. Goodrich has begun volume production of Carbopol, the water-soluble polymer the company calls "the most versatile agent for thickening, suspending, dispersing and emulsifying." The product, in the form of a fluffy white powder, will be turned out at a new $3-million plant at Calvert City, Ky. Present capacity is 70,000 lbs./month.

When used in cosmetics and toothpastes, Carbopol is said to provide smoother products; in creams and lotions, it's designed to eliminate drying and caking. It's also claimed that the addition of Carbopol will eliminate the "shake well before using" label from virtually any product. It's been approved for internal use.

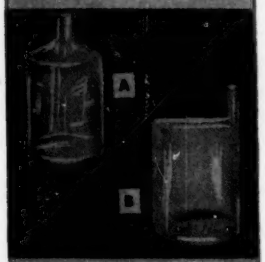
PRODUCTS

Extinguishing Beads: The first expandable polystyrene bead with self-extinguishing properties is being produced by Dow Chemical Co. Tradenamed Pelaspan 18, the new product is similar to Pelaspan 8, with self-extinguishing materials incorporated in the bead.

Peel-Over

"All-Chem" Spout*

Carton Liners



(A) Conical-Sleeve Spout
(B) Flat-Sleeve Spout

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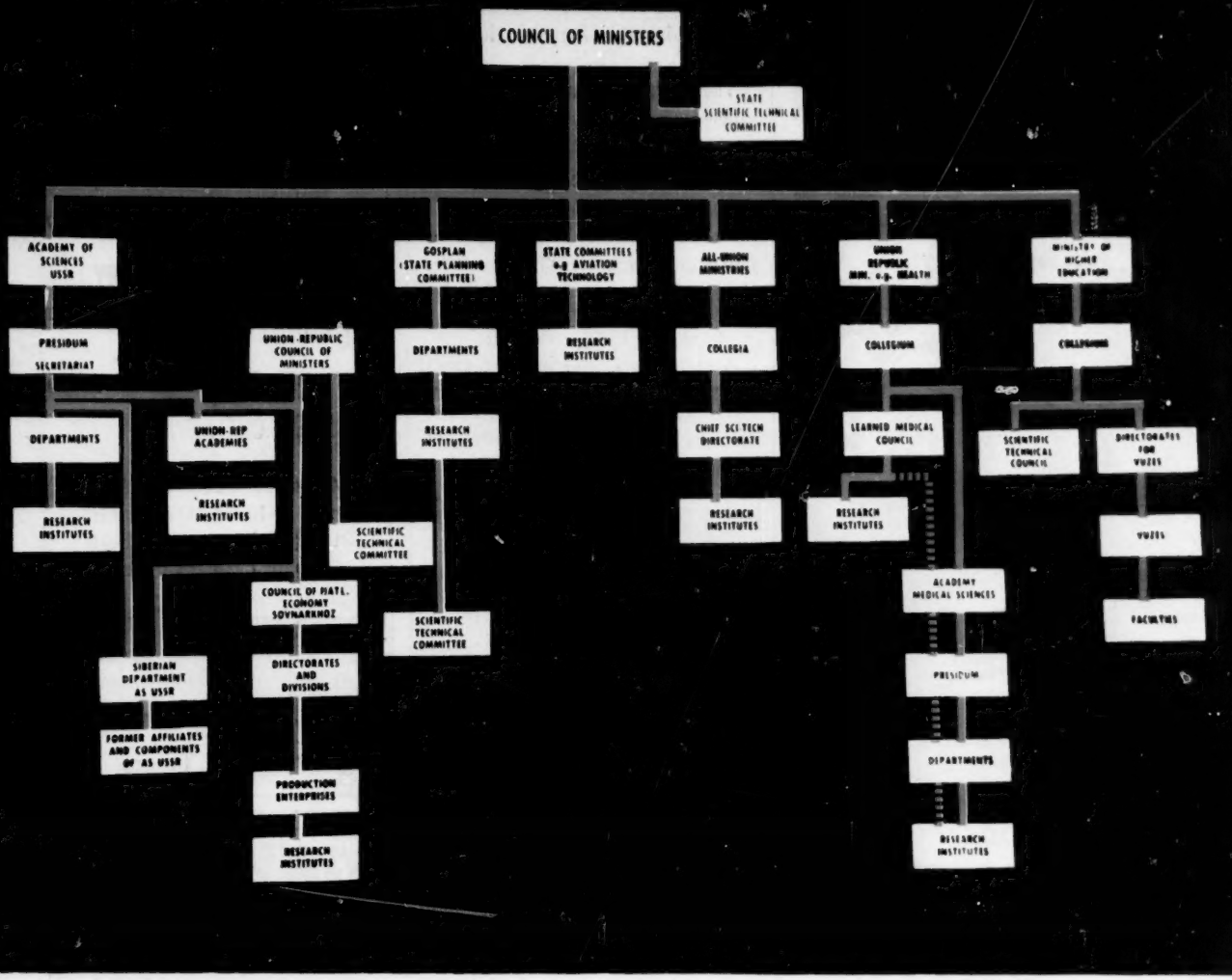


Decentralized research aids project planning and coordination, but may bog down with bureaucrats.

Reshuffled System Speeds Soviet Research

Russian research management has improved sharply and is steadily getting better, the U.S. Central Intelligence Agency disclosed last week. Key to the speedup: sweeping, new organizational changes.

Donald Chamberlain, chief of CIA's fundamental science division, office of scientific intelligence, told the 12th National Conference on the Administration of Research just how the Russians' new setup works. Conference host at Estes Park, Colo., was the University of Denver.

Now, said Chamberlain, the Russians can decide on and execute research programs more quickly than private U.S. or government research teams. The reason, he explained, is that six agencies *(see chart)* rather than three now direct Soviet scientific and technical efforts.

Decentralization: But the Soviets' program hasn't always been this good. Before the summer of '57, when the 3,000 scientific and technical institutions in Russia were controlled by three agencies—Academy of Sciences, All-Union Ministries and Ministry of Higher Education — authority was highly centralized and tended to create red tape. Research was inadequately planned and there was much duplication of research effort because of lack of coordination between these agencies. Also, a disproportionate number of research institutes were in the western Russian centers of Moscow, Kiev, Kharkov and Leningrad.

Now three additional agencies share research control. The key new agency is Gosplan (State Planning Committee). Union-Republic Ministries and State Scientific Technical Committee now also have a voice. (In general, the institutions under the ministries are much smaller and have lower-quality personnel than those in the Academy system—whose 130 institutions employ about 10% of Russia's scientific and technical manpower—and in the higher-education institutes.)

One result of this decentralization is the establishment of research institutions in Siberia, which formerly had none. Recently, the Soviets allocated $25 million for building 13 research centers in Novosibirsk. Included was a large facility for thermonuclear research. Another $25-million

program is providing eight institutes at Irkutsk.

The reorganization has also led to extensive relocation of scientific personnel. Many engineers and technicians are being sent from western Russia to the Siberian centers.

Not Kink-Free: While the reorganization has numerous advantages, according to Chamberlain, it has flaws. He believes the new system is overburdened with bureaucrats.

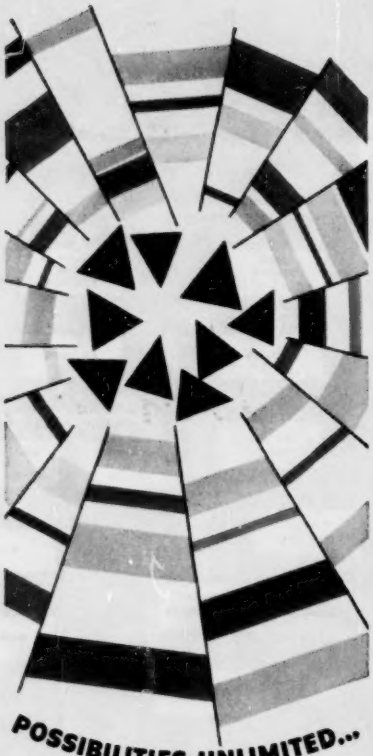
Also, while the Russians can afford to research a problem to greater depth than can U.S. industry (because they are not in a competitive domestic economy), they display a hesitancy to pull a product from research, put it into production.

CHAMBERLAIN: Labs for Siberia.

And when the Russians do start development, Chamberlain says, "they freeze the information and go ahead, in contrast with our usual method of making refinements as development and production progress."

"Their institutes operate much as do ours," he adds. "They have their director and supporting staffs the same as we. The only difference is that in addition to the director—a highly qualified scientist—there will be a secretariat staffed by a Communist party fanatic."

He believes, however, that the Russians' scientific and technical effort is vigorous and growing and that they will recognize faults and render harsh self-criticism. Scientists of proved ability make up the bulk of supervision at all levels. Party members are a distinct minority. They



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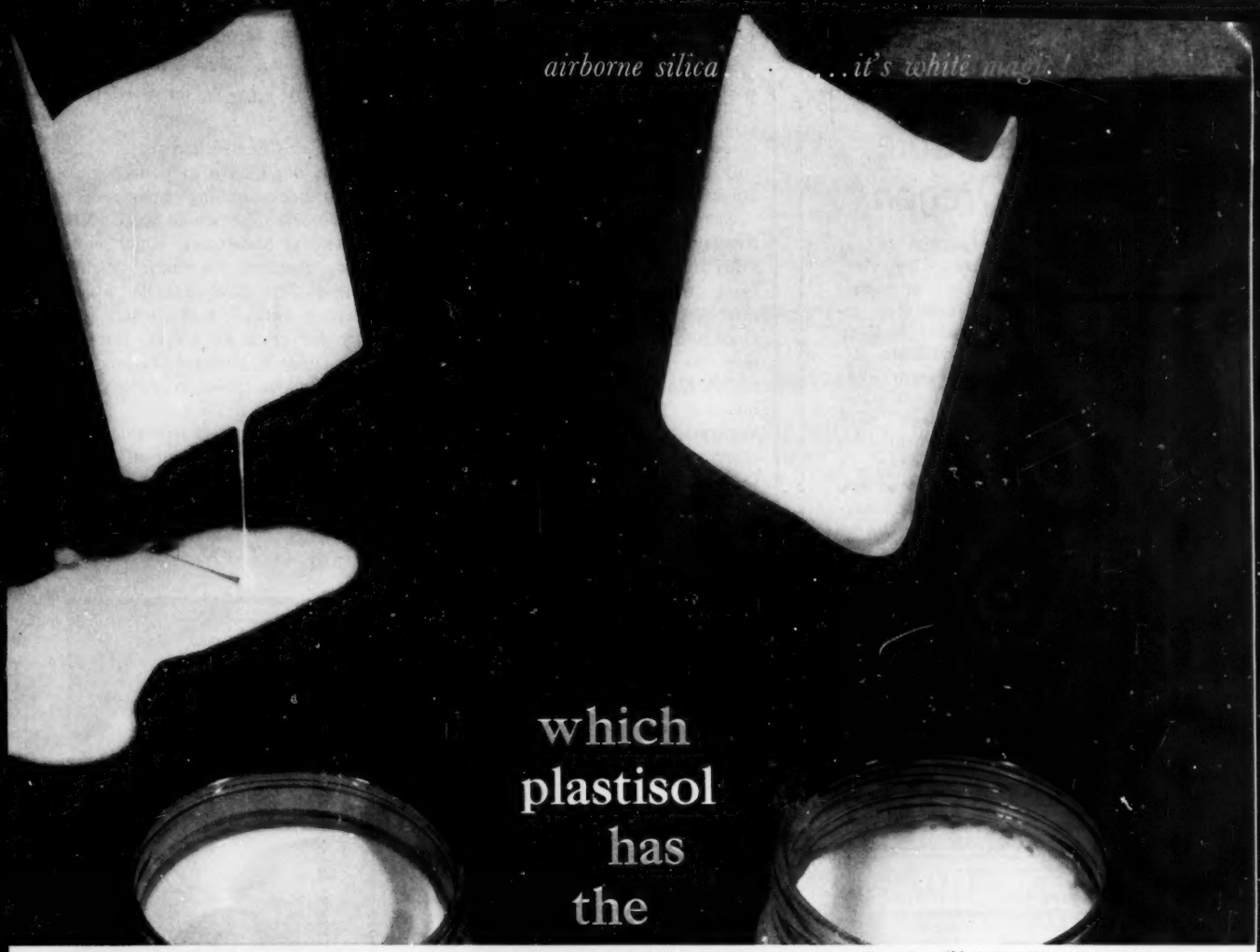

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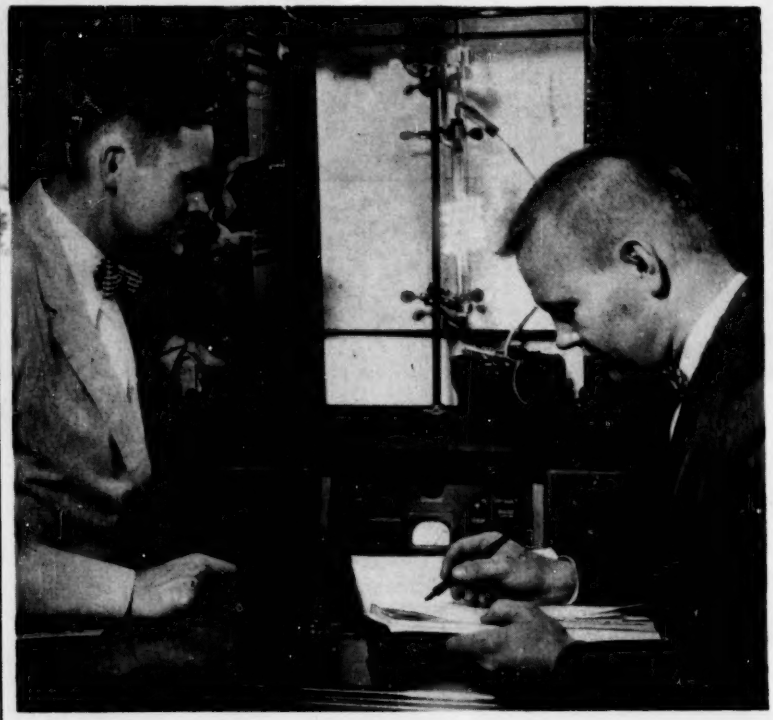
don't hinder the research, are there only to report on what is happening. Some may be scientists.

Chamberlain points out that the Russians' ability to make swift decisions and execute them quickly stems from the fundamental dictatorial methods of their political system. Once the Presidium reaches a decision, the order goes to the Council of Ministers and then to the agency involved. There is no need to await appropriations or authorizations by other agencies. Furthermore, very little effort is devoted to consumer research. "Without a large consumer industry, Chamberlain says, "the Russians don't have to pour personnel into the researching of new models of automobiles, household appliances."

Chemical Stalemate: Right now, Soviet chemical research slightly lags that of the U.S., generally, except in certain military fields, where it is on a par or a bit ahead. But the Soviet Union is obviously betting that its streamlined research system will tip this balance in its favor.

Augustus Kinzel, vice-president for research and development of Union Carbide Corp., agreed with Chamberlain during a panel discussion that



Thermal Reaction Starter

A new flash-heating technique, worked out by Bell Telephone Laboratories' (New York) Lloyd Nelson *(left)* and John Lundberg, is expected to aid research on high-temperature reactions. They use a high-speed flash lamp to quickly heat to reaction temperatures finely divided black body particles or filaments in transparent materials. Only a few milliseconds elapse between initiation and quenching of thermal reactions; subsequent unwanted reactions are barred.

The technique may be used with solids, liquids and gases, raises black body particle temperatures (in low-pressure gases) to 6-9000 F. And it may prove useful as a rapid way to determine whether there are any impurities in apparently pure plastic. For example, carbon black or dust particles in polyethylene give off gases when flash-heated, cause bubbles to form in the plastic.

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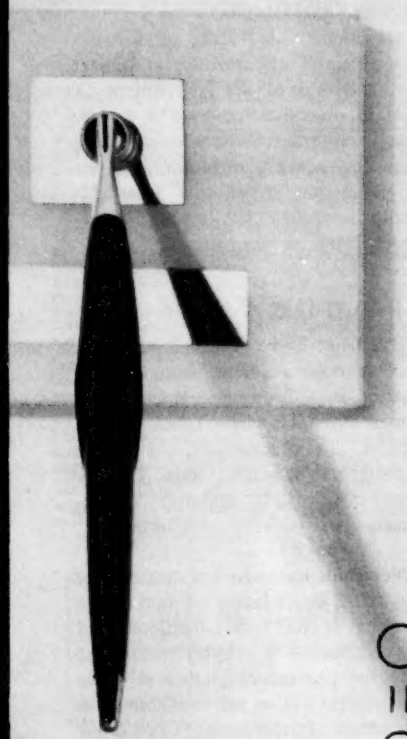

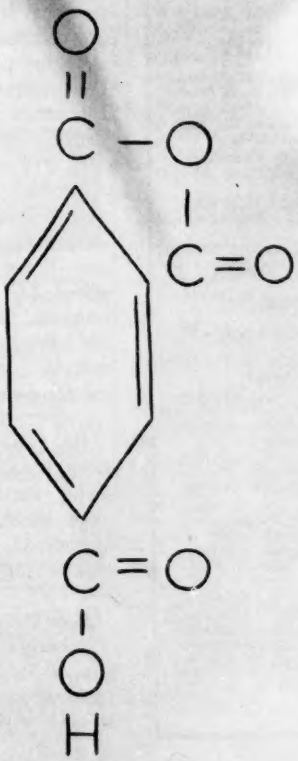

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RESEARCH

Russia's lack of a consumer industry permitted heavy concentration of research personnel on government-selected projects. Kinzel reported on a visit to Russia by a team of U. S. scientists. This group found that at one steel plant the research staff numbered more than 400. "A similar-size plant in the U.S.," Kinzel said, "has a research staff of 60. But then our plant has 400 salesmen."

Of course, the future of Russia's new research organization is subject to the whims of the government. A shift in objectives or even a de-emphasis on research would slow the knowledge-seeking juggernaut. But the reorganization shows that Russia is vitally interested in keeping its research program vigorous.

PRODUCTS

Ethylene Urea: Purified ethylene urea is now available from Metro-Atlantic, Inc. (Centredale, R.I.). Tradenamed Cyclo-Ethylene Urea, it's for use as an intermediate, in textile treating, and in making resin. The dry form or a 40% solution (tradenamed Atco 40-SP) are offered.

•

New Biochemicals: Collagenase for enzymatic degradation of connective tissue in medical investigations, and 3 - methoxy - 4 - hydroxymandelic acid for pharmacological and other biochemical studies are available from Chemicals Procurement Co. (New York).

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Alcohol Entry: Arapahoe Chemicals, Inc. (Boulder, Colo.) will supply neopentyl alcohol (2,2-dimethylpropanol), the esters of which are suggested for possible use in pharmaceuticals, flavoring and perfumery. A low boiling point (112-114 C) and high melting point (55-56 C) characterize the compound.

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Hot Gases: The Matheson Co., Inc. (East Rutherford, N.J.) is now supplying radioactive gases mixed with other gases. The mixtures contain krypton-85, gaseous carbon-14, tritium or sulfur-35 compounds.

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New Reagent: Fisher Scientific Co. (Pittsburgh) is introducing a solution (No. So-V-20) for fast colorimetric determination of aluminum in phosphoric acid bright-dip baths.

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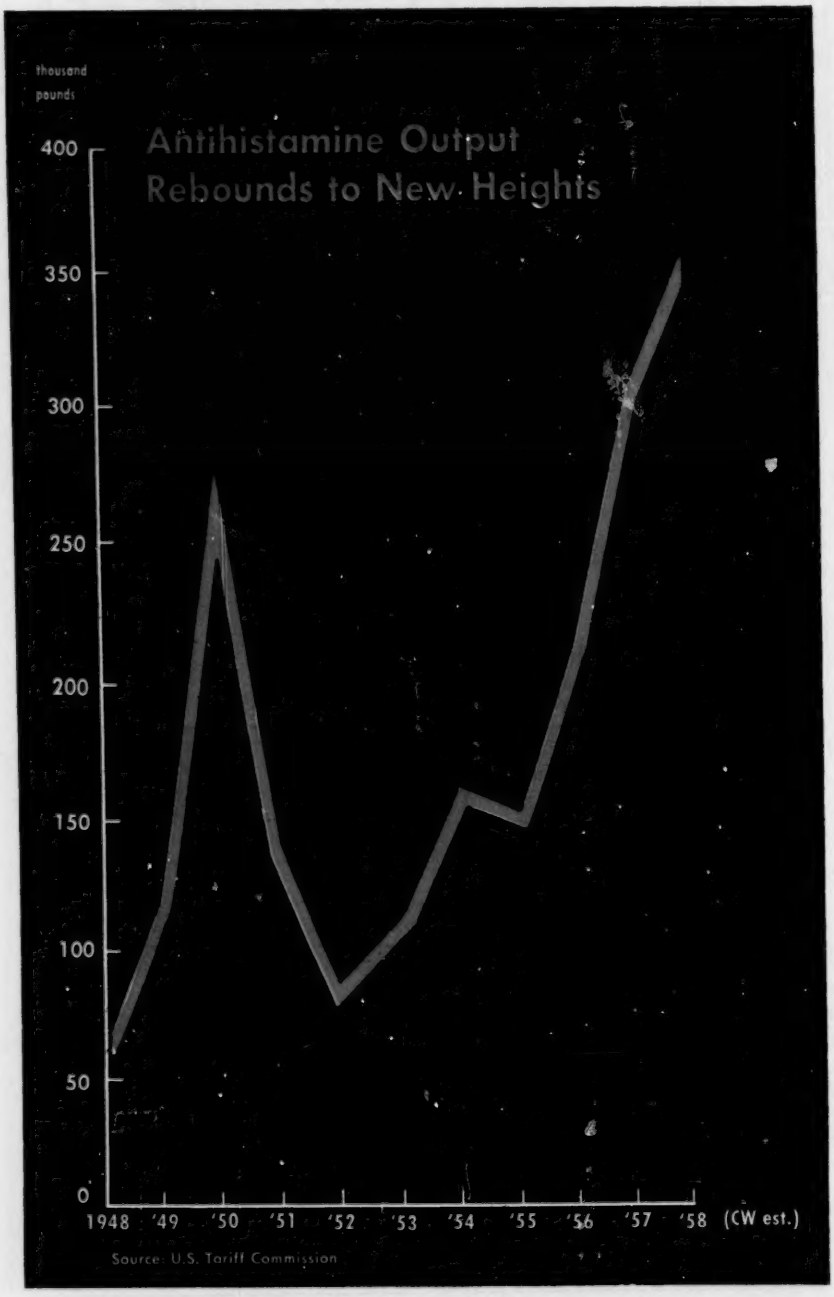
Antihistamine Output Again on the Upturn.



A new high in antihistamine production is expected this year, with total output for the year expected to peak at more than 355,000 lbs. That's nearly a 14% hike over last year's output of 307,000 lbs. and an impressive 300% surge over '52's production of 89,000 lbs.

Back in '48-'49 some producers touted the antihistamines as the "cure-all" for colds and allergies, caused output to jump from 116,000 lbs. in '49 to some 277,000 lbs. in '50, a 140% increase. But, by '52, disillusioned buyers had greatly curbed their purchases of the drugs, caused production of antihistamines to plummet to a low of 89,000 lbs.

Since then, the trend has turned upward. More judicious use and promotion of antihistamines in cold preparations and other ethical medications, as well as their established effectiveness in treatment of certain allergies, have brought a new boom to production.

One spokesman for the industry puts '60's output of antihistamines at more than 500,000 lbs., is confident that more uses will be found for these drugs.

Another source estimates sales of antihistamines at manufacturer's level at some $42 million this year, forecasts $75 million in '68.

U.S. Tariff Commission's latest synthetic organic chemicals report lists 17 manufacturers of antihistamines in '57. Back in '49, there were only nine reporting producers.

CW PHOTO—LIONEL CRAWFORD

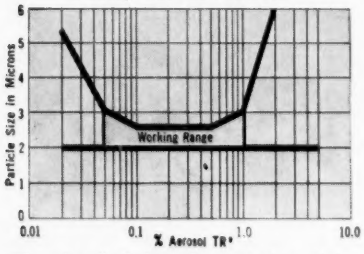
AEROSOL® TR

A NEW Surfactant That Produces Effective EMULSION POLYMERS

Emulsion polymerization enthusiasts are hailing a new aid to their art. Volume users are intrigued with the assurance of plentiful supply from Cyanamid's expanded production facilities. It's AEROSOL TR sodium bis (tridecyl) sulfosuccinate – a homologue of the well-known AEROSOL® OT Surface Active Agent. Having a very high oil solubility, AEROSOL TR is particularly effective for oil-in-water emulsions – and in emulsion-polymerization. For example, it offers:

1 – An unusually wide working range of surfactant concentration
2 – Production of small emulsion particles in a narrow size range

PVAc, FOR EXAMPLE



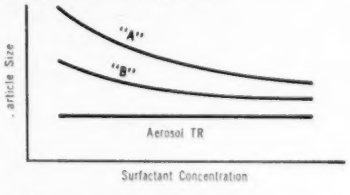
Thumbnailed above is a plot of particle size (microns) versus surfactant concentration for a typical vinyl acetate polymerization. Note, please, that a stable emulsion of very narrow particle size distribution range is formed through a twenty-fold concentration range of 0.05% to 1.0% AEROSOL TR. At an optimum (and still quite low) AEROSOL TR concentration of 0.1 to 0.5%, the resulting emulsion is stable, of low viscosity – and ideal for use in paint vehicles, adhesives, or coatings for fabric or paper. High rub resistance and storage stability in the emulsion form are complemented by excellent water resistance in the dried film.

A MATTER OF MICELLES

Work done at our Stamford Laboratories has borne out (to our own satisfaction at least) the micelle hypothesis of emulsion polymerization mechanics. At a certain critical concentration (approximately 0.03% in the case of AEROSOL TR), the surfactant ions start grouping into clusters, or "micelles," which act as centers for polymerization activity. We have found that suitable polymerization occurs only in the surfactant range where micelles are formed. At higher concentrations, the surfactant micelles tend to approach colloidal structure, and in such ranges (over 1.0% for AEROSOL TR) polymers formed are poor and unstable.

AN EXCEPTION TO A RULE

The rule, which is not entirely hard and fast, is that emulsion particle size tends to decrease as surfactant concentration increases. Under conditions of practical manufacture, this can result in noticeable variation in emulsion characteristics. An exception is our new AEROSOL TR. Through a twenty-fold concentration range, the resulting PVAc emulsion diagramed keeps within a particle size spread of 2 to 3 microns – and this is typical of its action in other emulsion polymerization systems.



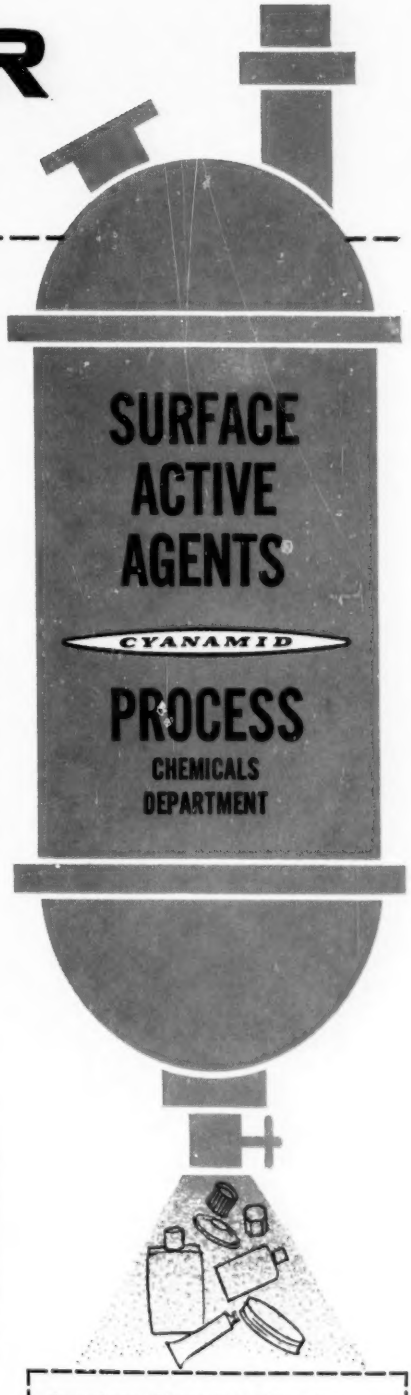
WE'LL SHARE SOME KNOW-HOW

For example, we have an informative data sheet on the formulation and polymerization techniques of AEROSOL TR relevant to vinyl acetate and styrene. Our technical booket on Surface Active Agents lists the properties, formulations, and application information of our other surface active agents, while our AEROSOL 22 booklet deals specifically with product information on this amazing surfactant. A check mark on the coupon below will bring them to you.

In our emulsion polymerization work, we are concerned with the broad field of resins and the wide range of AEROSOL Surfactants. A great deal of data has been accumulated that has not yet been formalized into technical bulletins. If you have a problem or two in emulsion polymerization, why not call in our field representative. He will obtain for you information that will be of assistance.

In any case, keep in mind the following list of very effective and versatile surface active agents.

AEROSOL® OT • AEROSOL® TR
AEROSOL® 22 • AEROSOL® MA
AEROSOL® AY • AEROSOL® 18
AEROSOL® OS • AEROSOL® C-61



American Cyanamid Company
Process Chemicals Department
30 Rockefeller Plaza, New York 20, N.Y.

Please send me –

☐ Data Sheet on AEROSOL TR
☐ Booklet on AEROSOL Surface Active Agents
☐ Booklet on AEROSOL 22

Name_____

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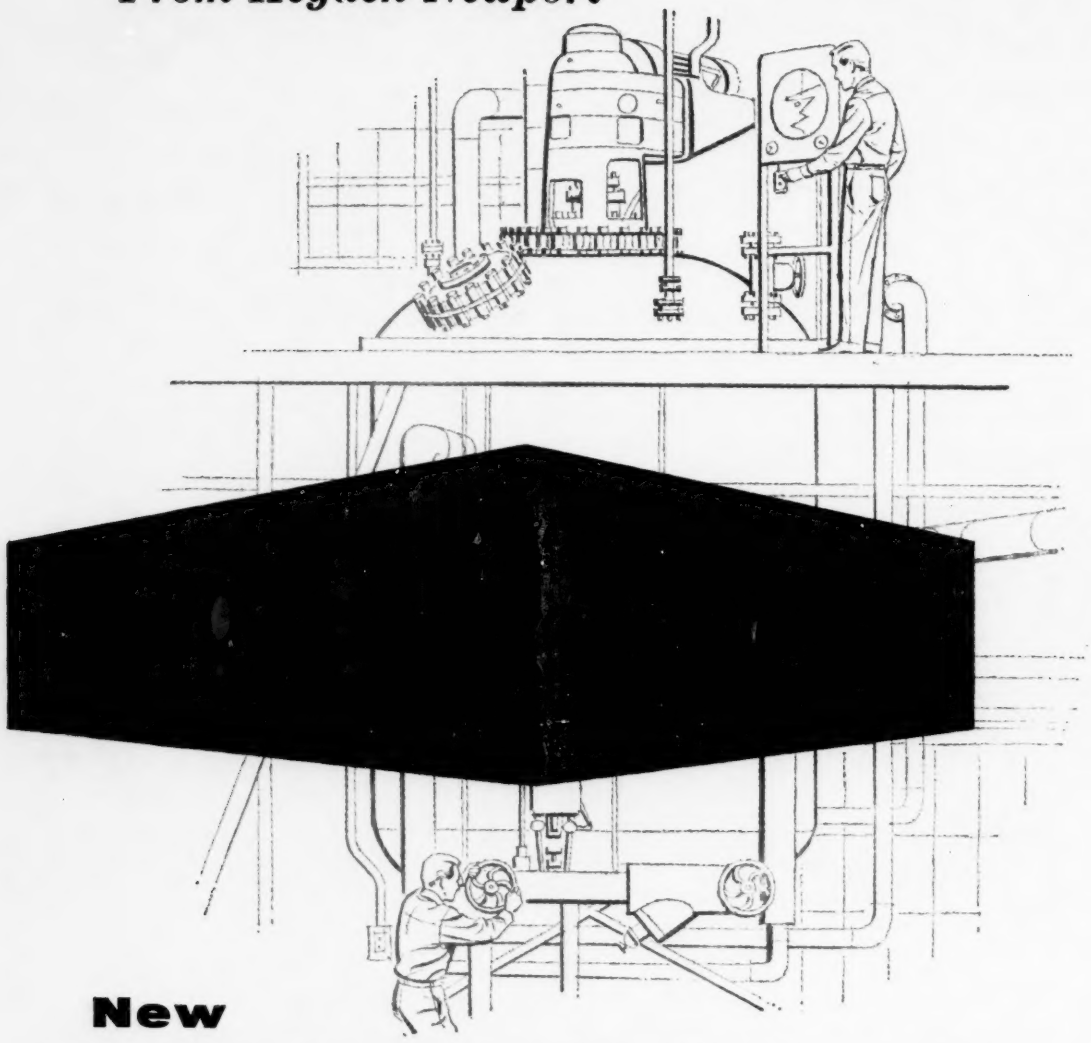

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